# FLIGHT

The AIRCRAFT ENGINEER & AIRSHIPS

**First Aeronautical Weekly in the World. Founded January, 1909.**

**Founder and Editor : STANLEY SPOONER**

**A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.**

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## Flight

*The Aircraft Engineer and Airships*

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**"FLIGHT" PHOTOGRAPHS.**

**To those desirous of obtaining copies of "Flight" Photographs, these can be supplied, enlarged or otherwise, upon application to Photo. Department, 36, Great Queen Street, W.C.2**

*For Sizes and Prices, see Advert. on page* iii.


**DIARY OF FORTHCOMING EVENTS**

*Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in this list :—*

**1927**

**Nov. 17** .... **"The use of the Wind Tunnel in the Prediction of Aeroplane Performance." Mr. R. K. Pierson, before R.Ae.E. and I.Ae.E.**

**Nov. 24** .... **"Modern Developments in Aircraft Instruments." Maj. C. J. Stewart, before R.Ae.S. and I.Ae.E.**

**Nov. 29** .... **First Meeting of Associated Club's General Council, at Royal Ae.C.**

**Dec. 1** .... **"The Problem of the Long Range Flying Boat." Maj. J. D. Rennie, before R.Ae.S. and I.Ae.E.**

**Dec. 2** .... **No. 3 Sqdn. R.F.C. and No. 3 (Fighter) Sqdn., R.A.F. 4th Reunion Dinner, at Trocadero.**

**Dec. 7** .... **"Air Power and its Application." Group-Capt. W. F. MacNeece Foster, Royal United Service Inst.**

**Dec. 8** .... **"Fog." Capt. F. Entwistle, before R.Ae.S. and I.Ae.E.**

## EDITORIAL COMMENT.

IT may be recalled that some months ago, when it seemed that about half of our pilots suffered from "Atlantitis," we expressed the view that no useful purpose would be served by those frequent attempts to repeat what had already been accomplished by others, and that if British pilots were anxious to do something worth while for British aviation, a much better way would be for them to turn their faces towards the East in an attempt to beat the world's distance record. It is, therefore, with unfeigned pleasure that we can record this week the start of such an attempt, having Karachi or beyond as its object. That McIntosh and Hinkler should have had to use a foreign machine—although the Bristol "Jupiter" engine is very British—is, of course, to be regretted, but it should be recollected that theirs is purely a private venture, and that the number of civilian machines in this country is strictly limited, with few if any available for flights such as this. Captain McIntosh doubtless would have preferred to make the attempt on a British machine, but at the time he was organising this attempt to fly the Atlantic from East to West it is to be assumed that he was for various reasons unable to obtain one. Now that he has set out for distant parts of the British Empire, he is not unnaturally using the same mount.

**Two Great Flights**

Both Capt. McIntosh and Mr. Hinkler are known to be cross-country pilots of quite exceptional experience, and barring very bad luck, they should succeed in their task. The Bristol "Jupiter" engine has already established a reputation for reliability, and there is no reason to doubt that the engine itself will be well capable of running for the 50 hours or so necessary to beat the existing world's record of 6,294 km. (3,910 miles) established by Clarence Chamberlin on the Bellanca monoplane by flying from New York to Helfta in Germany. There is always the problem of installation and accessories. A breakdown in any of these, although not strictly speaking an engine defect, may easily result in the failure of a flight such as this. Both McIntosh and Hinkler are, however, very painstaking and methodical in all they undertake, and we may accept it that

they will have taken every precaution possible to ensure success. The result of the flight will be known before this week's issue of FLIGHT reaches our readers, but not in time to be recorded here.

The second great flight of the week is due to start to-day, November 17, when Sir Alan Cobham, with Lady Cobham on board, is down to set out from the river Medway at Rochester in the Short-Rolls Royce "Singapore" flying-boat on the first stage of his projected flight of some 20,000 miles around Africa. Of a very different nature, this flight of survey is, if anything, of even greater importance in that it has "bring aviation to Africa" for its object, in the sense that it will cover large stretches where hitherto the aeroplane is very much of an unknown quantity.

As Sir Alan Cobham said at the luncheon at the Savoy Hotel, the flight is not, superficially at any rate, a spectacular one. No attempt will be made at "breaking records," and the pace will be a relatively leisurely one. On the other hand, the continuous worry of flying through a wide range of climatic conditions, of taking off and alighting some forty times, of finding the way over districts where landmarks are few and far between, will require a great deal of endurance and determination on the part of the crew, and the utmost reliability from engines and machines. Fortunately Sir Alan starts with very excellent equipment, and there is every reason to believe that he will successfully complete the task he has set himself. *En passant* an incident occurred on Tuesday of this week which serves to illustrate one of the advantages of the metal-hull flying-boat. Mr. Lankester Parker, the Short test pilot, had been out for a test flight on the "Singapore." It was low tide at the time, and in coming in to alight, the bottom of the hull struck some object in the water, which punched a hole in the hull. The machine was successfully brought in, and by the afternoon of the next day the damage had been repaired and the machine was flying again. Had the hull been of wood construction it seems probable that the damage would have spread much further, and repairs would have been very much more difficult. As a repetition of this accident is one of the not-unlikely occurrences during the long flight around Africa, it is to be hoped that spare sheets of Duralumin, rivets and other materials necessary for repairs will be carried on board. It is not suggested that the crew would, without the aid of slipways or hoisting tackle, be able to effect repairs to compare with those carried out at Rochester, but it might easily be possible, by a repair of even a very makeshift nature, to make a continuation of the flight possible under conditions where otherwise it might have to be abandoned.

As a means towards "opening up" large portions of British Africa, aviation can, and undoubtedly, will play an important part, and the Sir Charles Wakefield Survey Flight is of interest far beyond aviation circles, although the technical lessons to be learnt will be of inestimable value. The flight, it is not too much to say, is of Empire importance, and the best wishes of the British Empire will, we feel sure, follow the "Singapore" on its trail-blazing journey.

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**And the Airship**

With the British Government's airship policy moving forward, and the persistent recent attacks on that policy, the subject of airships is to the fore just now more than it has been for a long time. Whether or not our new rigids will be a success only time can tell. That they are experiments on a large scale few will probably deny, and we ourselves have occasionally expressed doubt as to the wisdom of tackling the problems on such an ambitious scale. We are confident, however, that every care is being taken to see that the new airships shall be structurally sound, and at the moment at any rate there is little justification for the bitter attacks which interested parties have launched against them.

It is, however, important that in concentrating on the large rigid airship, the claims to attention of the more modest semi-rigid should not be overlooked, and we are glad to be able to publish this week the first drawings of a new semi-rigid airship designed by British Airships, Limited. The new airship, of one million cubic feet capacity, incorporates certain novel features, and may be open to criticism on that score. We do not pose as practical airship experts, and shall not, therefore, presume to express an opinion. Others better qualified to judge will doubtless send along their views. We gather that the main object of the designers has been to combine efficiency with cheapness of construction, and it is claimed that the first airship can be built at very little greater cost than that of a modern three-engined commercial aeroplane. If that be so, and the running costs estimated are somewhere near the mark, it would seem that there is a distinct place for the semi-rigid in any future policy of Empire air communications.

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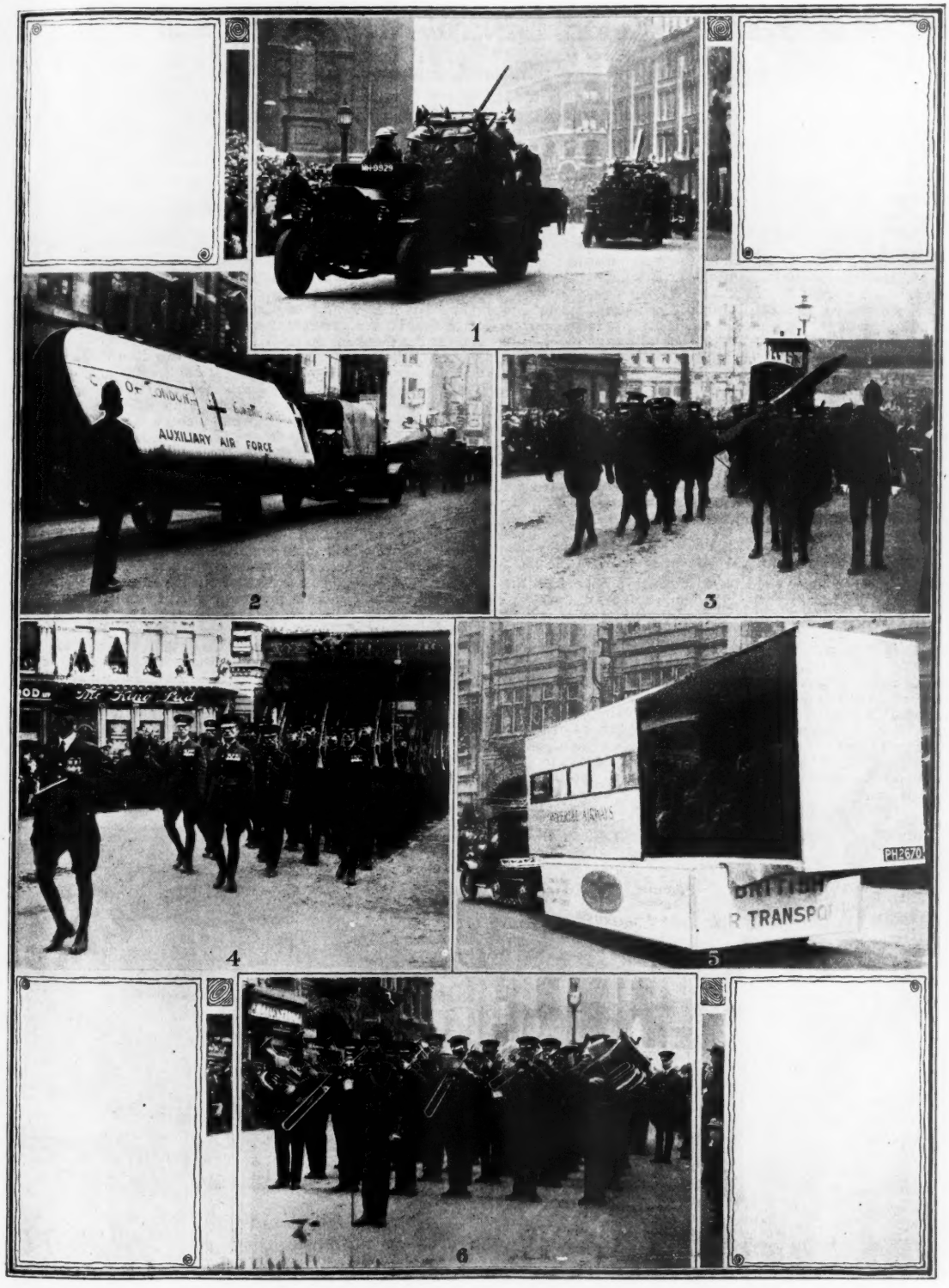
**Private Owners**

What is really a very remarkable document is published in our "Private Flying" section this week. This is a list of privately-owned aeroplanes registered in England at the present time. No less than 62 machines are included, and so rapid is the growth of private flying that it is highly probable that, although the list is recently compiled, the number already exceeds 70 machines.

That, in a couple of years, we should already have such a large number of people who own their own aeroplane is very gratifying indeed, and is a clear indication that those were quite wrong who, a few years ago, could "see nothing" in private flying. That the Light 'Plane Clubs have done much towards popularising flying there can, we think, be no doubt, although there are many private owners who would doubtless have bought their machines in any case.

Another welcome feature of the movement, although not brought out in the table, is that a very large percentage of these private owners use their machines frequently and extensively, many of them for extended tours of Europe, as many of the articles which have appeared in FLIGHT can testify. And the amount of touring done is on the increase, and will continue to increase more and more rapidly as time goes on. A stage has been reached where engines are so reliable, and require so comparatively little attention that owners with a knowledge of car engines find little difficulty in maintaining their aero engines. Hitherto by far the largest share of the development work which has made this state of affairs possible has been carried out by a very small number of aircraft firms, and still fewer engine firms, but other machines and other engines are coming into use, and the whole future of the private flying movement looks extremely promising.




["FLIGHT" *Photographs*

**IN THE LORD MAYOR'S SHOW : Aviation occupied quite a prominent place in this year's procession. Our photographs show : (1) One sub-section each of the 53rd and 54th City of London Anti-Aircraft Artillery Brigade. (2) and (3) A D.H.9a day-bomber escorted by a contingent of No. 600 City of London Bombing Squadron, Auxiliary Air Force. (4) Detachment of the Royal Air Force. (5) Passenger saloon of "Argosy" Air Liner. (6) Band of the Royal Air Force**

# A NEW BRITISH SEMI-RIGID AIRSHIP

## B.S.R.1 of One Million Cubic Feet Capacity

IN our issue of October 13, 1927, we recorded briefly the formation of a new British company for the purpose of designing a semi-rigid airship incorporating certain rather unusual features, and yet of such a form of construction that the cost of building should work out very low. British Airships, Ltd., the firm in question, has now progressed with the design to the stage where it is permissible to give a brief illustrated description of the airship as planned. The drawings given are somewhat in the nature of outlines, but will, it is thought, serve to illustrate the main features of the design, and the special innovations that have been introduced.

Cheapness of construction is one of the claims advanced by the designers of B.S.R.1, and as the company does not itself propose to undertake construction, but will have the various components of the airship manufactured by specialist firms, the cost estimate given is presumably based upon costs quoted by these various firms. It is estimated that the first airship, with mooring mast and equipment for handling on the ground, will be in the neighbourhood of £26,000, although probably under rather than over this figure. As the airship is calculated to have a useful lift of approximately 15¾ tons, it will be realised that a wide range of combinations of fuel load and pay load can be arranged for. For instance, it is estimated that a useful load of 8 tons could be transported 500 miles; 5½ tons, 1,000 miles; and 3 tons, 1,500 miles.

### Technical Features

From the accompanying illustrations it will be seen that the fundamental feature of the design is a new form of "twin keel," mainly enclosed inside the envelope in such a manner as to reduce head resistance by avoiding as far as possible any projections causing unfair shapes. The keel, constructed in the form of two girders of Duralumin, may be likened to the chassis frame of a motor car, and cross-members at intervals serve to tie the two keels together. For the greater part of their length these two keels run parallel, but towards both ends they are joined by end sections sloping upwards and inwards so as to meet in the extreme bows and tail of the envelope. From these two points a cable runs the whole length of the envelope, forming a bracing to the overhung end girders.

Towards the front, the space between keels is built into a large passenger saloon, just aft of which are arranged ten sleeping cabins. Windows in the sloping sides of the saloon will afford an excellent view for the passengers, while the control cabin is right in front, forming a separate compartment of the main saloon, with which it communicates by means of a door. An artist's impression of what the saloon will look like is published on this page.

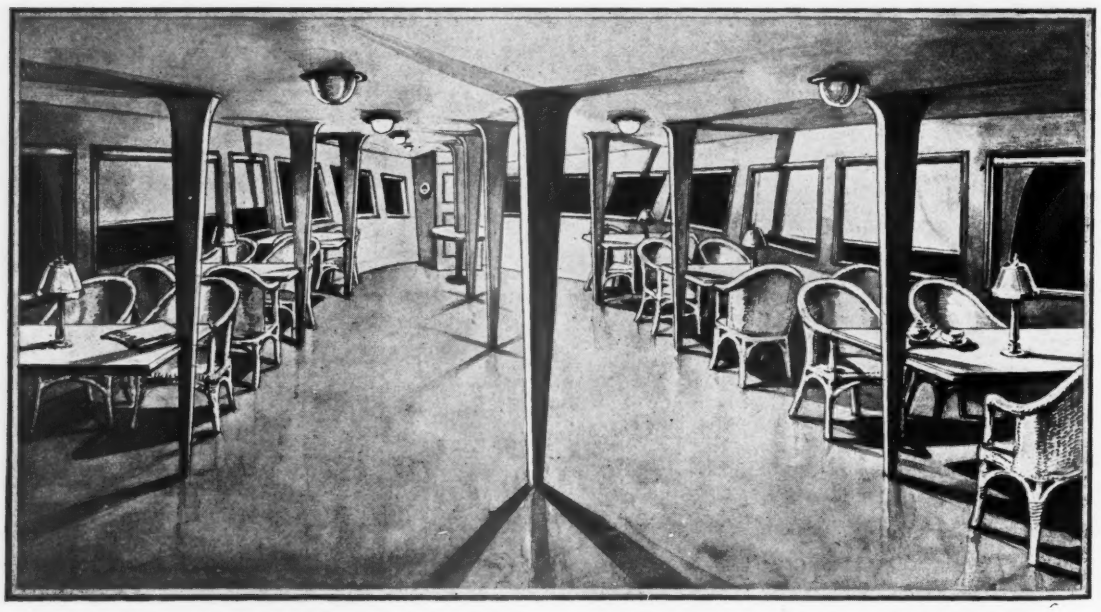
The main envelope is divided into several compartments by lateral diaphragms so as to avoid excessive surging of the gas, and also to prevent the entire envelope from becoming completely deflated in case of a puncture. The rigging which transmits the weight of the keels and their loads to the envelope is of somewhat unusual type, and is illustrated in one of the diagrams on p. 791.

The ballonnets are arranged as shown in the diagrams, passing across the top of the saloon and cabins, and, in conjunction with a sheet of asbestos, effectively separating the saloon and quarters generally from the gas envelope. Aft of the cabin, etc., the air ballonnets extend downwards between the two keels in order to obtain as large air capacity as possible.

### Power Plant

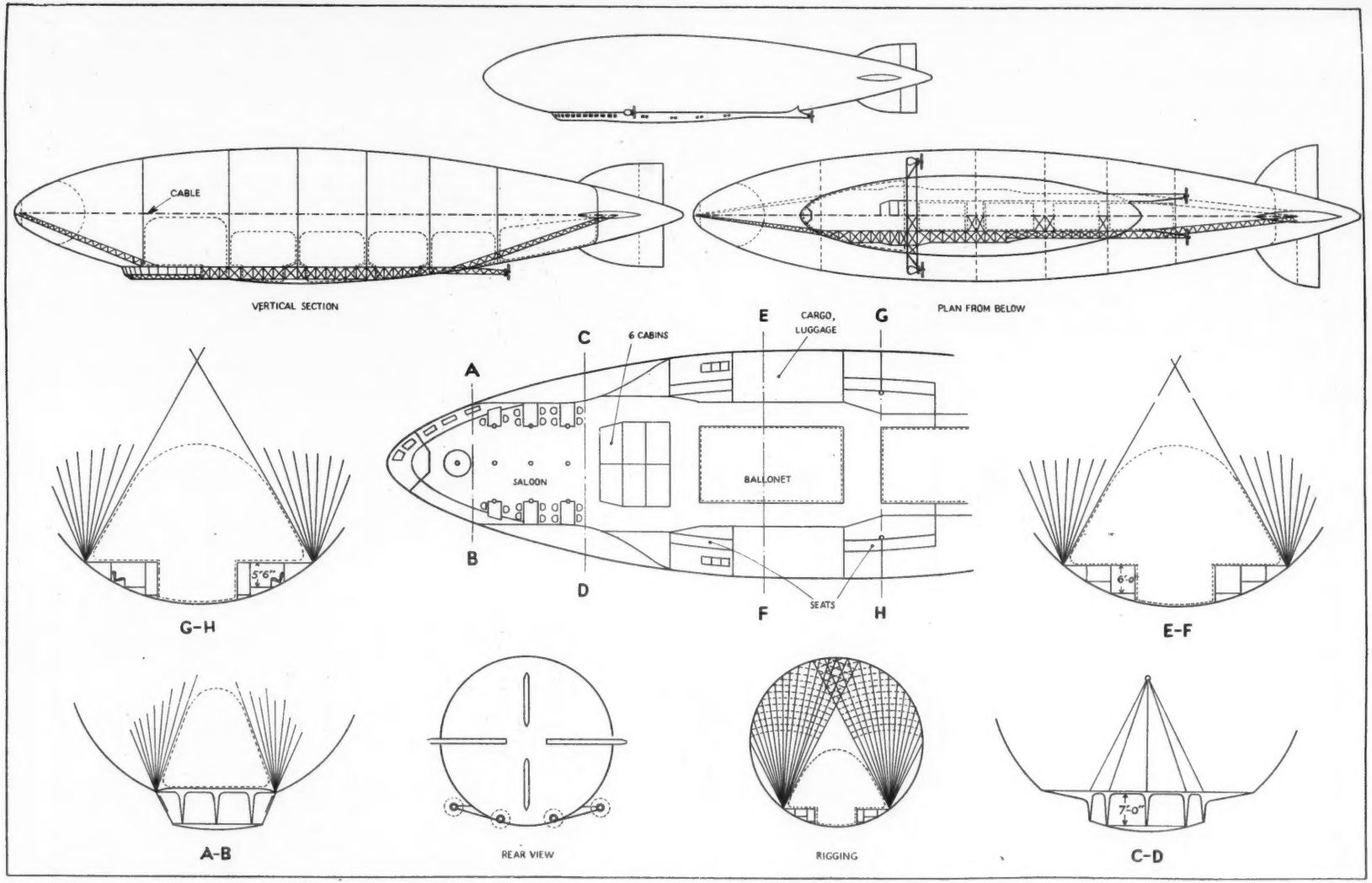
The power plant is to consist of four main engines, possibly with a fifth in reserve which, when not in use, will be raised inside the keel structure so as to offer no extra head resistance. Of the four main engines, two are mounted aft, in the ends of the straight portions of the keels, while two are situated forward, on extensions of the lateral girder. The fuel will be stored in tanks in the keels. At the moment the actual type of engine to be used has not been decided upon, but in the speed and range estimates a total power (for four engines) of 1,200 h.p. has been assumed, so that the engines will probably be of a type developing about 300 h.p. each. With this power it is estimated that the maximum speed will be 70 m.p.h., while a cruising speed of 50 m.p.h. has been assumed.

The main specification of B.S.R.1 calls for a total capacity of 1,000,000 cub. ft., and it is intended to give the airship a length of 363 ft. and a maximum diameter of 78½ ft., so that the airship will be of relative small fineness ratio (4·6). The total power will be 1,200 h.p. with four engines and 1,500



["FLIGHT" *Copyright Drawing*

**A PEEP INTO THE FUTURE: An artist's impression of what the saloon of B.S.R.1 will look like. The number of passengers for which there will be accommodation will depend upon the range desired.**




**DESIGN FOR NEW BRITISH SEMI-RIGID AIRSHIP : These diagrams show the general lay-out, cabin arrangement, rigging, etc., of B.S.R.1, a one million cub. ft. ship, incorporating several novel features.**

h.p. with five. As already mentioned, the maximum speed is estimated at 70 m.p.h., and the cruising speed at 50 m.p.h. The gross lift will be 30·35 tons, and as the tare weight is estimated at 14·54 tons, the disposable lift will be 15·81 tons.

Mention has already been made of the fact that it is estimated that the initial cost of the airship will be in the neighbourhood of £26,000. The first filling with hydrogen would it is estimated, cost £1,750, which corresponds to a cost of 35*s.* per 1,000 cub. ft. An estimate based upon a total of 1,200 h.p. indicates that the fuel cost would be in the region of £50 per 500 miles. The figure would obviously vary according to whether a favourable or unfavourable wind was met with, but the figure quoted is thought to represent a fair average. This cost is, of course, proportionate to the distance travelled. Hydrogen for refilling will, it is thought, amount to approximately £60 for each 1,000 ft. climbed during the journey, and thus this item would vary according to the route. Climatic conditions and leakage would also affect this figure.

Based upon above estimates the following table has been prepared by British Airships, Ltd., to show fuel and refill costs for journeys to places situated at distances of 500, 1,000 and 1,500 miles from London :—

| Town. | Distance. Miles. | Max. Height. Feet. | Fuel Cost. £ | Gas Cost £ |
|---|---|---|---|---|
| Hamburg .. | 500 | 1,200 | 50 | 72 |
| Lyons.. .. | 500 | 2,500 | 50 | 150 |
| Warsaw .. | 1,000 | 1,200 | 100 | 72 |
| Malta.. .. | 1,500 | 3,000 | 150 | 180 |
| Moscow .. | 1,500 | 1,600 | 150 | 96 |
| Constantinople | 1,500 | 1,600 | 150 | 108 |

As the pay load for distances of 500, 1,000 and 1,500 miles has been estimated to be 8 tons, 5½ tons and 3 tons respectively it should be possible to operate services at a profit by charging passenger fares and postal rates not very much higher than existing ones. Certainly depreciation, salaries and various overhead charges must be added to the items given above, but British Airships, Ltd., feel certain that with the system of construction which has been evolved, resulting in low first cost and extremely low " ground work " cost, these items will be very reasonable.

Although a detailed description cannot be given at present, it is of interest to mention that the special type of mooring mast contemplated will cost but £3,000. A portable mooring mast, capable of being transported on lorries, and erected under its own power by the ground staff, has also been evolved, and some idea of the simplifications that have been attained may be formed when we point out that it is estimated that the airship will be able to pick up its moorings employing only the ship's crew and a ground staff of two or three men.

Finally, it may be stated that the special form of keel construction evolved is regarded as making it quite feasible to bring the airship down to the surface of the water and anchor it there while taking on board or discharging passengers. The general principle of achieving this has already been established, but certain minor details are still in the design state, so that little may be said concerning it at the moment. It is not claimed that the airship would be able safely to ride out a gale of wind on a rough sea, but it is firmly believed that in sheltered waters such as are to be found in many places, and not least important in the neighbourhood of London, this operation will be quite easily carried out.

Handling on the ground is regarded as being just as simple, and here again new methods of anchoring the airship and of handling it have been devised, which are claimed to reduce the cost to a very small figure.

We gather that British Airships, Ltd., would welcome criticisms from airship experts, and that the designers of B.S.R.1 are confident that most, if not all, of the " snags " in semi-rigid construction and operation have been overcome in the new design.

# The Royal Aero Club of the United Kingdom

## OFFICIAL NOTICES TO MEMBERS

### THE COMMITTEE—NOVEMBER 9, 1927

**Present :**—Lieut.-Col. M. O'Gorman, C.B. (in the chair) ; Griffith Brewer ; Sir Alan J. Cobham, K.B.E., A.F.C. ; Lieut.-Col. M. O. Darby, O.B.E. ; F. Handley Page, C.B.E. ; Maj. H. A. Petre, D.S.O., M.C. ; Capt. C. B. Wilson, M.C. ; Harold E. Perrin, Secretary.

**Election of Members :**—The following new members were elected :—

Charles Hodgson Blackburn.
Andre Marcel Desoutter.
Richard Ashley Hall.
Henry Edward Pooley.
Howard John Saint.
Sidney Thomas Tipper.

**Aviators' Certificates :**—The following Aviators' Certificates were granted :—

| | | |
|---|---|---|
| 8172 | Richard Kenneth Lax .. | Yorkshire Aeroplane Club. |
| 8173 | Charles Winn Fellows .. | Midland Aero Club, Ltd. |
| 8174 | William Scott King .. | Henderson Flying School. |
| 8175 | John Rowley .. .. | Lancashire Aero Club. |
| 8176 | Geoffrey Barnard Falconer | Hampshire Aeroplane Club. |
| 8177 | Charles Edward Shaw .. | Newcastle-on-Tyne Aero Club. |
| 8178 | Ronald Henry Cooper .. | Hampshire Aeroplane Club. |
| 8179 | William Thomas James Stanford | Hampshire Aeroplane Club. |

Offices: THE ROYAL AERO CLUB,
3, CLIFFORD STREET, LONDON, W. 1.
H. E. PERRIN, Secretary.

### Air Force Memorial

MARSHAL OF THE AIR FORCE SIR HUGH TRENCHARD laid a wreath on the R.A.F. Memorial at the Embankment on November 11, in the presence of many senior R.A.F. officers and relatives and friends of the airmen. He was accompanied by Air Vice-Marshal Sir Philip Game, Air Commodore F. V. Holt (representing Air Marshal Sir John Salmond), and Wing-Commander E. R. L. Corballis. Wreaths were also placed on the Memorial by Wing-Commander W. H. Anderson and Sqdn.-Ldr. W. R. Kenny, representing Australia and Canada respectively.

### Air Minister at Cricklewood

ON November 18 Sir Samuel Hoare will inspect the Handley-Page slot device at Cricklewood and fly in a Bristol " Fighter " to which the idea has been applied.

### Difficulties of Air Disarmament

SIR SAMUEL HOARE spoke at a League of Nations Union meeting at Southend on November 10. Referring to limitation of armaments, he said the problem of air arms was a very difficult one, for two reasons. First of all, it was a very technical problem. They were dealing with a number of machines that were flying to-day and were scrapped to-morrow, each type of which differed from another type, almost each machine of which differed from another machine. There was another difficulty peculiar to the air arm, the fact that it was very difficult to draw the line of distinction between the military and the civil aeroplane. They had always taken the view that it would be a calamity to restrict the useful activities of the air for civil uses and operations.

### Director of Civil Aviation at Norwich

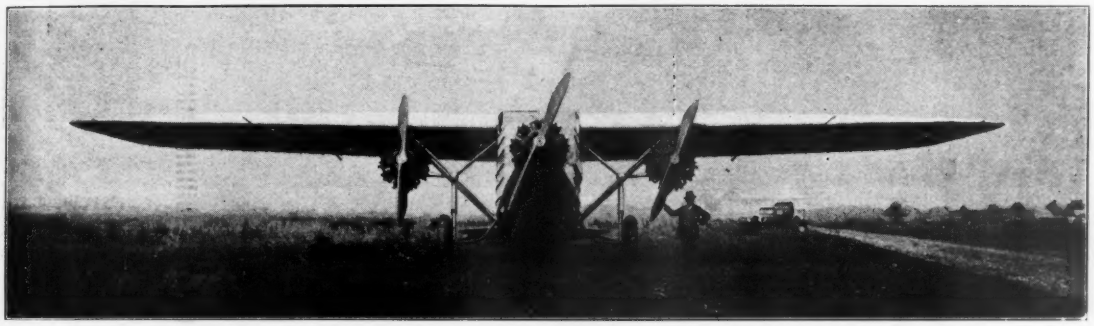
SIR SEFTON BRANCKER visited the Norfolk and Norwich Aero Club at Mousehold Aerodrome, Norwich, on November 10. He was received by the Lord Mayor (Mr. H. E. Witard). In the course of a speech, Sir Sefton dwelt upon the possibilities of Norwich becoming a Customs station for merchandise from the Continent.

FLIGHT

# FIRST FRENCH ALL-METAL COMMERCIAL AEROPLANE

## The "Avimeta" A.V.M.132

WHAT is probably the first French all-metal commercial aeroplane has recently been finished at the works of the *Societe pour la Construction d'Avions Metalliques* "Avimeta" of Courbevoie-sur-Seine. This firm, it may be recollected, exhibited at the last Paris Aero Show a monoplane fighter of somewhat unorthodox design and construction, but of all-metal construction, even to the wing covering. The new machine, although of very different design, is similar to the exhibition monoplane not only in being a monoplane but also in having its wing covering of metal. The metal used almost exclusively in the construction is that known as "Alferium," an aluminium alloy manufactured by the Schneider firm.



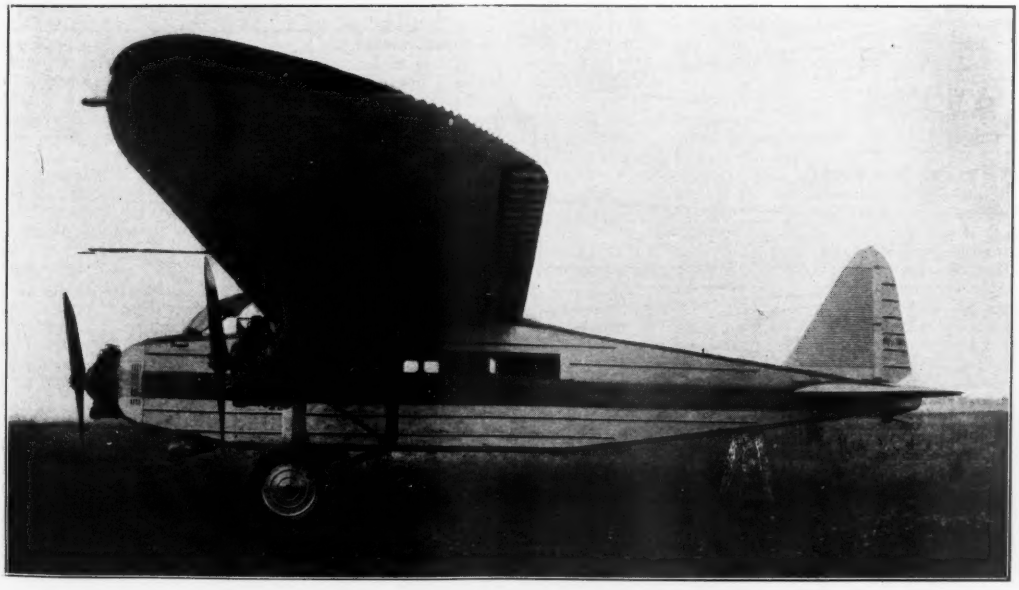
**THE "AVIMETA" A.V.M.132 : Front View. The engines are Salmsons, of 230 h.p. each.**

The "Avimeta" A.V.M.132 is a three-engined monoplane of the same general type as the Fokker F.VII 3-m, but differing from that machine both constructionally and in several features of its design.

The monoplane wing, the two halves of which are attached to the fuselage by two quick-release devices each, is of trapezoidal plan form, with rounded wing tips. Details of the wing section used are not available, but from the fact that the wing is practically a cantilever, the section must be a fairly thick one. There are two main spars, and a certain number of fore and aft members to which is rivetted the corrugated wing covering which is bent to form the wing section. On each side a pair of struts run from the lower longerons to the wing spars, being attached to the latter at the points of support of the outboard engines. Other struts run to the top longerons of the fuselage. The undercarriage struts (telescopic) are taken to the junction of these wing struts with one another, while the rear chassis struts, acting as radius rods, are hinged to the lower longerons of the fuselage, as are also the sharply bent wheel axles. The ailerons, which are of narrow chord, run the entire span of the wing, and are operated from cranks on the front spar via an external tube under the wing, visible in some of the photographs.

The fuselage is of rectangular section, and has four main longerons in the form of tubes carrying formers to which the sheet metal covering is rivetted. The fuselage is in three sections for ease of transport. The front portion extends from the nose to a point just aft of the cabin. The rear portion is the tail unit, and the middle portion extends from aft of the cabin to the tail.

The front portion of the fuselage is of slightly different construction, being so designed that bulkheads, bracing, etc., interfere as little as possible with the free space of the cabin. The latter is of large proportions, measuring 3·9 m. (12 ft. 9 in.) in length, 1·6 m. (5 ft. 3 in.) in width, and 1·8 m. (5 ft. 11 in.) in height. This space can either be used as



**THE "AVIMETA" A.V.M.132; Side View.**

**THE "AVIMETA" A.V.M.132: View of Fuselage, engines, undercarriage, etc.**

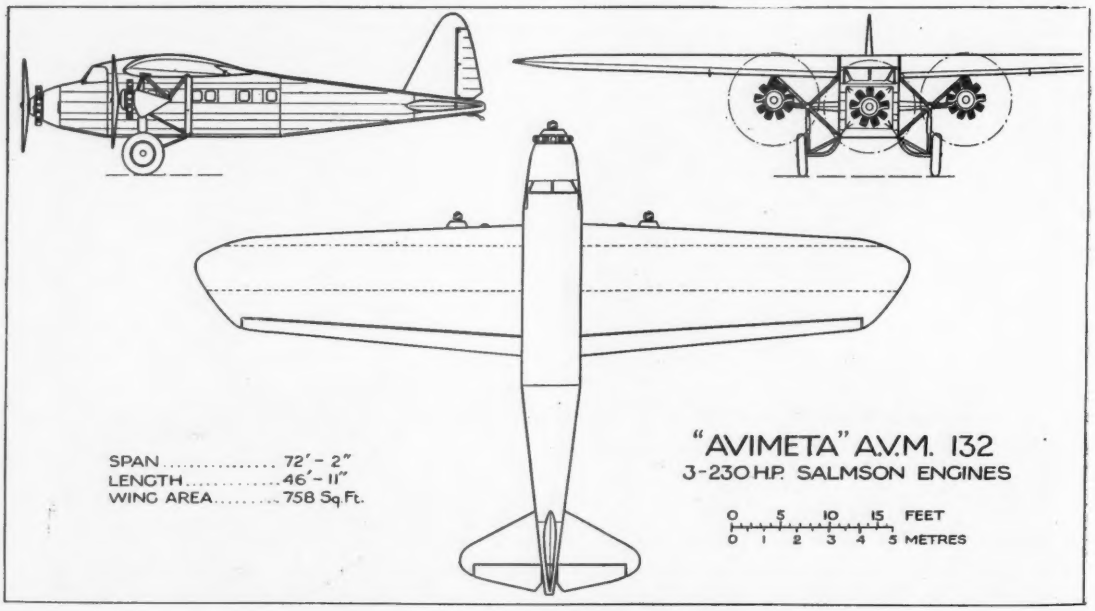
one cabin arranged as a Pulman, or can be divided into two separate compartments with beds. The machine will, we understand, be produced in two types, one for ordinary day flying and one for night flying. The total loaded weights of the two types will differ somewhat. Details of these will be given at the end of these notes.

An unusual feature of the tail of the A.V.M.132 is that the vertical surfaces, fin and rudder, are of the same size as, and interchangeable with, one-half of the horizontal surfaces. That is to say the fin is identical with one half of the tail plane, and the rudder identical with one elevator flap. While having the advantage of reducing the number of spares, and possibly the cost of production slightly, this arrangement would appear open to criticism on the score that the resultant vertical tail areas are somewhat small. The rudder particularly appears to English eyes inadequate to deal with turning moments set up by the stoppage of one of the outboard engines. The fin is adjustable, but only on the ground, so that no assistance is to be expected from it in such a contingency. The tail plane, on the other hand, is provided with a trimming gear.

The power plant of the A.V.M.132 consists of three Salmson radial air-cooled engines of the 9 AB type, developing a nominal power of 230 h.p. each. The petrol tanks are situated in the wing, with direct gravity feed. They are provided with jettison valves so that in an emergency the tanks can be emptied while the machine is flying.

The cockpit for the crew is ahead of the cabin and provided with a wind screen merging into the roof of the cabin. Dual controls are provided, and the machine is equipped with both transmitting and receiving wireless apparatus.

Following are the main characteristics of the "Avimeta" A.V.M.132:—Wing span, 21·9 m. (71 ft. 10 in.); length overall, 14·3 m. (46 ft. 11 in.); wing area, 71 m². (764 sq. ft.); tare weight, 2,700 kg. (5,940 lbs.); weight of crew, 160 kg. (352 lbs.); weight of fuel, 820 kg. (1,800 lbs.); paying load,




**THE "AVIMETA" A.V.M.132: General Arrangement drawings.**

1,200 kg. (2,640 lbs.) ; total loaded weight, 4,880 kg. (10,732 lbs.) ; wing loading, 68·5 kg./m² (14 lbs./sq. ft.) ; power loading (on 690 h.p.), 6·8 kg./h.p. (15·5 lbs./h.p.) ; maximum speed, 182 km./h. (113 m.p.h.) ; cruising speed, 170 km./h. (105 m.p.h.) ; climb to 2,000 m. (6·600 ft.) in 19 mins. ; theoretical ceiling, 3,750 m. (12,300 ft.) ; range at cruising speed, 900 km. (560 miles).

These figures all relate to the machine as equipped for day flying. The night-flying machine has a slightly higher tare weight (6,200 lbs.), carries less fuel (1,100 lbs.) and a smaller paying load (1,800 lbs.). This results in a reduced range (370 miles), a better climb, and a higher ceiling.

Although the " Avimeta " A.V.M. 132 incorporates certain features which can be criticised, the machine looks a promising type, and it will be interesting to see how it behaves on actual service once the preliminary tests, which are now proceeding, have been completed. The ratio of tare weight to total loaded weight is very good, possibly owing to the use of the " Alferium " alloy. The factor of safety is given as 7·5 for the day machine and 8 for the night flyer.

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# THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS—AND MODEL AIRSHIPS

ON Monday, November 14, Air Vice-Marshal Sir W. Sefton-Brancker, K.C.B., A.F.C., delivered a highly informative and interesting lecture before the Society of Model Aeronautical Engineers at the Y.M.C.A. in Tottenham Court Road, the subject being " The Development of Commercial Flying," illustrated with numerous slides.

Comparing modern air liners as evolved by British and German constructors, Sir Sefton pointed out that we had developed very good three-engined biplanes, which carried a reserve of power sufficient to enable them to be flown with one engine cut out. The De Havilland " Hercules " was a good example of this, and also of typical British construction—that is, steel fuselage and wooden wings. The German constructors, on the other hand, had developed the all-metal monoplane with considerable success, the best example being the Dornier Wal flying boat, which is flying on a number of European routes. A bad feature of the German designs, however, is the fact that none of them will fly with one engine cut out, there being not sufficient reserve of power. Sir Sefton was of the opinion that we in this country would eventually turn over to the all-metal monoplane with thick wings as being far cheaper to maintain than our existing types.

Statistics making a comparision of results obtained in the first year of flying after the war with the present time were then quoted. Running cost, insurance, for example, had dropped from 35 per cent. to 7¼ per cent. in certain cases. Petrol and oil costs had dropped from 30 per cent. to 27 per cent., and in this direction he forecasted the arrival of the heavy oil engine, which with luck may weigh eventually as little as 2 lb per horse-power. And whereas engines used to run about 100 hours between overhauls, they would now do 300 hours, and he expected eventually 500. Paying loads had increased also, although the three-engined machine with its reserve of power rather handicapped us in this direction. A machine is, however, being built for the Anglo-Persian Oil Company which will carry a paying load as high as 6¼ lb. per horse-power, the purpose of this machine being to carry, in eight trips, a drilling plant to any point on the oilfields.

Speed, too, means economy of operation, because insurance rates, pay of personnel, etc., are proportional to the actual flying time, and he indicated vast improvement which would come as a result of proper streamline and lighter construction.

Sir Sefton then turned to the consideration of the future developments of airship routes. That whereas heavier-than-air operation had now become pretty well cut and dried, little data was available at present as to the best routes for Empire travel, but it rather looked as though we would revert to the old sailing ship practice, making use of favourable winds and avoiding monsoons on the southerly routes. He suggested a route to Australia *via* East Africa, Durban and Perth, returning *via* India.

The various Colonial Governments concerned will provide the necessary air ports, and they are gradually taking this up. The air port at Ismalia was shown on the screen as typical, with its mooring mast, oil and hydrogen plants. Two big ships carrying 100 passengers each at 70 knots are to be available by the autumn of 1928, and although plans for trying these out are as yet not settled, it is expected that the Canadian route will be developed as a commencement. He suggested that, where possible, Arctic routes would be very advantageous. The temperature conditions, although very low, would not vary much between day and night, and consequently the loss of gas and ballast would be reduced thereby to a minimum.

Making a general survey of the present position of commercial flying, Sir Sefton said that he envied the young men of the flying industry ; that whereas he personally had lived long enough to see some of his dreams realised, they, on the other hand, would live to participate in the actual fulfulment of all of them. He very modestly made no mention of his own share in inaugurating Empire travel, and of his famous flight to India and back with Alan Cobham. He did, however, emphasise the fact that commercial flying is just on the eve of paying its way, and in America one company has managed to pay 100 per cent. dividend. As soon as these facts become obvious to the general public there will be an immediate boom in the industry, and it is up to us to become air-minded and prepare the industry as a whole, so as to be able to partake of the rewards that are bound to follow.

A lively discussion then took place and Sir Sefton answered questions as to the construction and possibilities of the pterodactyl, and the tail-first aeroplane, and the Handley Page slotted wing.

Following on Sir Sefton's remarks about the as yet unknown potentialities of airship operation, Captain Chambers proposed that the Society form a section devoted to model airships, for educational, experimental and research purposes. Estimating the cost per model as £10 and upwards, he proposed that makers of fabric, motors and necessary material be approached with the idea of assisting constructors, and putting up prizes for competitions to be held, so that competitors, even if they did not win a prize, would be supplied with materials free of cost. He also asked the support of the Air Ministry in this, and suggested that they might draw up specifications for intending model makers to work to. Sir Sefton readily agreed to the proposition, deciding to go into the question of specifications at the first opportunity, and he proposed that a Committee be formed to develop an Airship section in the Society.

The suggestion of forming a model Airship Section roused considerable enthusiasm, and in view of the assistance offered from several quarters, it seems certain that this new development will prove to be a success.

The meeting concluded with a very hearty vote of thanks to Sir Sefton Brancker for his very able and interesting lecture, and arrangements were made for another lecture at the Y.M.C.A. on December 16, to be given by Capt. C. F. M. Chambers, D.S.C., on " Airships, Past, Present and Future."

[NOTE.—Regarding the above suggestion of forming a model airship section, we think this is a very excellent one, with great possibilities before it. We hope to say more on this subject later, but meanwhile will any of our readers who have had experience with model airships, or any who may be particularly interested in this new development ,please communicate with FLIGHT regarding this matter ?—ED.]

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### Far East Flight Commences

CAPT. R. H. MCINTOSH and Mr. Bert Hinkler left Upavon Aerodrome (Wilts.) on November 15 in an attempt to beat the long-distance non-stop record of 3,911·1 miles held by Mr. Clarence Chamberlin and Mr. Levine. They are flying a Fokker monoplane fitted with a Bristol " Jupiter " engine and the machine is called " Princess Xenia." Sufficient fuel is being carried to last for 47 hours.

### The " Red Rose " at Basra

ON November 10 Capt. Lancaster and Mrs. Keith Miller reached Basra in their Avro " Avian." They were escorted by Air Force machines and had started from Ur in the Chaldees, where two nights had been spent owing to magneto trouble. It is expected that the " Red Rose," as the machine is called, will be delayed at Basra for ten days whilst a new magneto is sent from England.

# THE FLIGHT ROUND AFRICA

## Luncheon in Honour of Sir Alan Cobham

THE Director of Civil Aviation, Air Vice-Marshal Sir Sefton Brancker, presided at a luncheon given in honour of Sir Alan Cobham at the Savoy Hotel on November 15. In proposing the health of "Sir Alan Cobham and Gladys, his wife," Sir Sefton paid a tribute to Sir Alan as a pilot, a navigator, a business man, but most of all as a great organiser. Sir Alan had the particular kind of courage which enabled him to shoulder great responsibilities.

As an instance of the esteem in which Sir Alan was held in insurance circles, Sir Sefton read a letter from an underwriter who had not for ten years undertaken aircraft insurance. Owing to the fact that the expedition would be in the hands of Sir Alan Cobham, however, he had agreed to take part of the risk. That, the chairman said, was a business man's testimony to Cobham's efficiency. He understood that as a matter of fact the insurance asked for this flight was about the same as that which used to be charged for a sailing vessel going to Australia.

Sir Alan Cobham said the flight upon which they were starting was not a spectacular one, but he claimed that it was one of utility. They were going to do their best, by intensive propaganda, to attract the interest of the African public towards the necessity of air communications. It was a true saying that in opening out new territory it was essential to have good communications, as then women could accompany their menfolk, and it was not until that was possible that a country could really be opened up. There was a lot of talk about commercial aviation, and about making aviation pay. In a country like Africa, which was waiting to be developed, it was of small importance whether an air line paid in itself or not. The important point was that an air line opened the way for developing the country. He gave as an instance of this a railway in Malaya. The building of the railway had resulted in opening up tremendous tracts of land, and these had contributed millions of pounds to the government. Yet the railway itself did not pay, and possibly never would.

In referring to his equipment, Sir Alan said that in the Short "Singapore" with its economical Rolls-Royce "Condor" engines he thought he had the best possible equipment for the job. There would be some 40 take-offs and 40 alightings during the flight, which meant that there would be at least 80 opportunities of making a mistake. He hoped, however, that no mistakes would be made. The publicity given to the flight before the start added greatly to his responsibilities, but he was hopeful that they would complete the flight and return with the machine and engines in the same state as when leaving.

On this occasion he was glad to say he was taking his wife with him. She was the best secretary he had ever had, and on the flight much of the office work would be done by her.

In conclusion, Sir Alan paid a warm tribute to the man who, by his generous support, had made the flight possible. Once more the "Patron Saint of Aviation," Sir Charles Wakefield had come forward with the required financial assistance, and it was significant that when Sir Alan first approached him on the subject Sir Charles's first question was, "Will it be a safe flight?" his first concern was for the crew.

Among those who had accepted invitations to the luncheon were :—

Sir Charles Wakefield, Lieut.-Col. I. A. E. Edwards (Technical Adviser, Directorate of Civil Aviation) Air Commodore J. L. Forbes, Capt. F. E. Guest, M.P., Air Commodore A. M. Longmore, Wing-Commander R. B. Maycock, Lieut.-Col. J. T. C. Moore-Brabazon, M.P., Lieut.-Col. H. W. S. Outram, Maj. R. E. Penny, Mr. H. E. Perrin, Col. the Master of Sempill (Chairman of the Royal Aeronautical Society), Col. Warwick Wright, Mr. Woods Humphrey, Maj. J. S. Buchanan and Lieut.-Col. L. F. R. Fell (Air Ministry), Capt. Goodman Crouch (Airworthiness Department, Farnborough), and Mr. F. G. L. Bertram (Deputy Director of Civil Aviation).

The Short "Singapore" is due to leave Rochester shortly after lunch today, November 17, and will then proceed *via* London Bridge, Westminster Bridge, Hammersmith Bridge, Kew Bridge, Richmond, Staines and Reading to Winchester, Southampton and Calshot, whence the start will be made for the first stage of the flight—Bordeaux.

Sir Alan Cobham will be in command of the expedition, and will have with him Lady Cobham, Capt. H. V. Worrall, D.S.C. (assistant pilot), Messrs. F. Green and C. E. Conway (engineers), and Mr. S. R. Bonnett (cinematographer).

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**R.A.F. Gramophone Courses**

SPECIAL courses in French, German, Italian and Spanish, recorded for the gramophone by the Linguaphone Institute, have been supplied to education officers of Royal Air Force stations by the Education Department of the Ministry. Twelve stations, including one or two overseas, have now been equipped in this fashion as part of the free course of study offered to any member of the Air Force.

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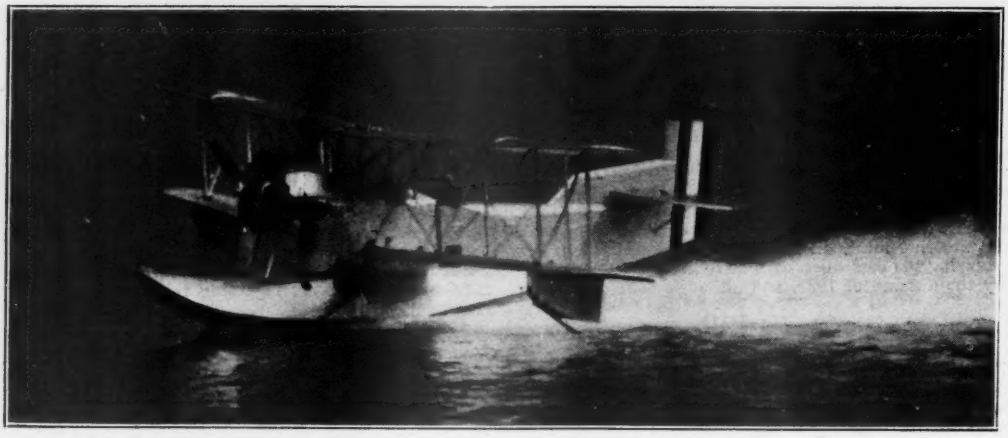

**A NEW AMERICAN AMPHIBIAN : The Loening OL.8, fitted with a 425 h.p. Pratt and Whitney "Wasp" air-cooled radial engine, which recently completed successful trials for the U.S. Navy Bureau of Aeronautics.**

["FLIGHT" *Photograph*

**A CLIPPER OF THE CLOUDS: The Short "Singapore," with two Rolls-Royce "Condor" engines, on which Sir Alan Cobham is starting to-day on his 20,000 miles' flight around Africa, photographed during a test flight over the Medway.**

# PRIVATE FLYING

**A Section of FLIGHT in the Interests of the Private Owner, Owner-Pilot, and Club Member**

## THE PRIVATE OWNERS' LIST

**REVISED LIST OF PRIVATE OWNERS IN THIS COUNTRY:**

| Name of Owner. | Type of Machine | Identification Letters | Date of Last Registration |
|---|---|---|---|
| Duchess of Bedford | D.H. "Moth X" | G-EBRI | 18.5.27 |
| Hon. Lady Bailey | D.H. "Moth" | G-EBPU | 1.1.26 |
| Sir Harold Bowden | D.H. "Moth X" | G-EBSK | 28.7.27 |
| Miss S. O'Brien | D.H. "Moth" | G-EBOS | 2.8.27 |
| R. A. Bruce | Westland—"Widgeon III" | G-EBRL | 11.5.27 |
| M. G. W. Burton | D.H. "Moth X" | G-EBRH | 18.5.27 |
| F/O. G. Boyes | D.H.53 | G-EBHZ | 23.7.25 |
| Mrs. Maia Carberry | D.H. "Moth X" | G-EBSQ | 11.8.27 |
| Mrs. Maia Carberry | Fokker "Universal" | G-EBUT | 19.10.27 |
| R. P. Cooper | D.H. "Moth" | G-EBMU | 10.10.27 |
| F/Lt. N. Comper | C.L.A.3 | G-EBMC | 30.7.25 |
| Hon. G. Cuncliffe | D.H. "Moth" | G-EBPM | 18.11.26 |
| R. G. Cazalet | Westland—"Widgeon III" | G-EBRM | 7.9.27 |
| P/O. T. H. Carr | B.E.2e | G-EANW | 2.7.26 |
| Marquis of Douglas and Clydesdale | D.H. "Moth X" | G-EBSU | 8.8.27 |
| J. P. Drew | Avro "Avian" | G-EBTY | 12.9.27 |
| A. H. Downes-Shaw | D.H. "Moth X" | G-EBST | 8.8.27 |
| W. Baxter Ellis | D.H.53 | G-EBTT | 5.9.27 |
| Rt. Hon. F. E. Guest | D.H. "Moth" | G-EBUS | 19.10.27 |
| F. Gough | D.H.53 | G-EBRW | 27.10.27 |
| Lady S. Heath | Avro "Avian" | G-EBQL | 20.9.27 |
| Lady S. Heath | S.E.5a | G-EBPA | 30.7.26 |
| Lady S. Heath | D. H. "Moth" | G-EBMV | 11.7.27 |
| Capt. G. de Havilland | D.H. "Moth X" | G-EBSF | 7.7.27 |
| Capt. E. Hayes | D.H. "Moth" | G-EBQW | 12.4.27 |
| H. E. Hamer | D.H. "Moth" | G-EBNX | 22.4.26 |
| H. Hollindrake | Avro "Avian" | G-EBTP | 17.8.27 |
| Bert Hinkler | Avro "Avian" | G-EBOV | 7.4.27 |
| W. Hay | S.E.5a | G-EBTO | 17.8.27 |
| K. Hunter | S.E.5a | G-EBQK | 19.3.27 |
| A. C. M. Jackaman | D.H. "Moth X" | G-EBRT | 31.5.27 |
| N. H. Jones | A.N.E.C.2 | G-EBJO | 28.9.26 |
| D. Kittel | D.H. "Moth X" | G-EBTH | 8.8.27 |
| G. Linnell | D.H. "Moth X" | G-EBSA | 21.7.27 |
| F. D. Mill | D.H. "Moth X" | G-EBTI | —.8.27 |
| I. McClure | D.H. "Moth X" | G-EBUR | 18.10.27 |
| G. Merton | D.H. "Moth" | G-EBQZ | 31.5.27 |
| Lieut. G. Madocks | S.E.5a | G-EBQO | 4.4.27 |
| Capt. A. Milburn | D.H. "Moth X" | G-EBRZ | 30.6.27 |
| Nigel Norman | Avro 548 | G-EBPJ | 25.10.26 |
| Lord Ossulston | D.H. "Moth" | G-EBPT | 1.12.26 |
| L. R. Oldmeadows | S.E.5a | G-EBTK | 9.8.27 |
| Sq/Ld. H. M. Probyn | Westland — "Widgeon III" | G-EBRQ | 11.7.27 |
| L. G. Richardson | D.H. "Moth" | G-EBPQ | 3.5.27 |
| B. B. F. Russell | D.H. "Moth" | G-EBNO | 2.8.27 |
| Dr. Whitehead Reid | S.E.5a | G-EBCA | 20.10.22 |
| Sir John Rhodes | D.H. "Moth" | G-EBNM | 19.2.26 |
| T. Richardson | Avro 548 | G-EAAL | 25.5.26 |
| Miss W. E. Spooner | D.H. "Moth" | G-EBOT | 2.8.27 |
| A. Smith | English Electric "Wren" | G-EBNV | 9.4.26 |
| F/O. A. F. Scroggs | Westland—"Wood Pigeon" | G-EBIY | 12.5.27 |
| F/Lt. F. O. Soden | B & P—P9 | G-EBEQ | 10.9.26 |
| L. Taylor | Westland—"Wood Pigeon II" | G-EBJV | 27.6.27 |
| R. N. Thompson | D.H.53 | G-EBRK | 23.5.27 |
| F/Lt. A. M. Wray | Bristol "Scout" | G-EAGR | 20.6.27 |
| G. N. Warwick | A.N.E.C. IV "Missel Thrush" | G-EBPI | 28.4.27 |
| E. R. Wilson | D.H.53 | G-EBRJ | 20.5.27 |
| D. A. N. Watt | Sopwith—"Grasshopper" | G-EAIN | 17.8.25 |
| D. A. N. Watt | S.E.5a | G-EBOG | 5.6.26 |
| D. A. N. Watt | Sopwith "Scooter" | G-EACZ | 17.8.26 |
| Air Com. J. Weir | D.H.51 | G-EBIQ | 3.4.26 |
| F/O. A. H. Wheeler | S.E.5a | G-EBQM | 22.3.27 |

A PERIODICAL revision of the list of private owners in this country always means addition and cancellation, but the tendency is for increasing. The names that drop out do not signify a drooping interest in flying. For instance, the importance of aerodromes and landing fields is vividly shown by the experience of one of our private owners, Capt. W. R. Bailey, who recently sold his "Moth" owing to the shortage or complete absence of landing grounds in Monmouth and South Wales generally. He tells us that if an aerodrome could be made at little expense near Cardiff he has about £2,000 promised by local people in support of a Light Aeroplane Club. The only two available places for a good aerodrome are owned by two people who refuse to have anything to do with aeroplanes. It seems a great pity that this excellent sum should go begging through this reason. Another of our most successful private owners rightly points out a further disadvantage without organised landing grounds. This is the danger of leaving one's machine when landing in a field. An interested crowd immediately collects and will not believe they are looking at an aeroplane until they poke it to prove it. If the engine was kept running it ought to keep them at bay. Someone, though, would be bound to see if the "prop." hurt, and bring compensatory troubles on the harassed owner, apart from the extra expense of fuel consumption.

An interesting convert to piloting and possessing one's own machine is Mrs. Maia Carberry, who has qualified with the London Aeroplane Club, and now owns a "Moth X"; also a Fokker "Universal" six-seater, which her husband, Mr. Carberry, may possibly fly out to Kenya when their visit to this country terminates. The "Moth" owned by Sir Harold Bowden will belong to the Nottingham Aero Club, which was one of the four new lucky clubs to be favoured by the recent extension of the subsidy. Their instructor, Mr. Bernard Martin, has just completed a C.F.S. course, and has flown the "SK" in many air races this year with varying success. The Rt. Hon. F. E. Guest becomes the possessor of a "Moth X," although this is not the first machine he has owned.

Lady Heath, a name that conceals the well-known Mrs. Elliot-Lynn, now has quite a fleet of machines, comprising an "Avian," "Moth" and "S.E.5a." She has also ordered a new "Avian" to take with her to South Africa shortly. Her husband, Sir James Heath, is also interested in flying, and during a recent visit to Manchester he accepted an invitation to become vice-president of the Lancashire Aeroplane Club. Incidentally the "Avian" that Lady Heath flew to the Zurich meeting this year, and which was immediately snapped up by some enthusiasts there, viz., Mr. Simonius, Dr. Clavel and Mr. A. Ehinger, is giving them complete satisfaction. They demonstrated it at Thun lately, where a flying club is being formed under the leadership of Col. Messner, president of the Swiss Aero Club.

Mishaps have resulted in Mr. I. McClure and Mr. D. Kittel deciding upon the extra outlay and acquiring the "X" type of "Moth." This is quite a popular move on the part of

owners of the "Moth" machines, for the burden is appreciably eased by the system of giving the old machine in part exchange.

Mr. Will Hay enters this latest list of owners with an "S.E.5a" fitted with an "Airdisco" engine. He is the well-known music-hall artist, who qualified as a pilot at the London Aeroplane Club, and has been in many air races. At the Hooton Park meeting this year he carried off the landing competition. Mr. Jackaman is the owner of a "Moth" and became rather prominent some months ago for his early morning flights from his home at Slough to Littlehampton for the admirable purpose of getting a dip in the sea there. Unfortunately, he met with a mishap when lifting off to return one morning, and crashed. He and his brother, who was often his passenger on these flights, were injured, but have now happily recovered.

On his A.N.E.C. II Mr. N. H. Jones distinguished himself this year by carrying off the Air League Challenge Cup in July at Castle Bromwich. Flight-Lieut. D. V. Carnegie has sold his D.H.53, as he was one of the R.A.F. officers chosen to accompany the great flying-boat cruise now on its way to Australia and Singapore. He was a member of the Suffolk Club. Miss W. E. Spooner, although but recently qualified, flew her "Moth" solo to visit the venue of the Schneider Trophy Race. On returning, she had the misfortune to have an unavoidable landing in a street at Albaros, which turned the machine right over on its back, yet without injury to Miss Spooner or the "Moth." The machine was later brought back by boat.

Mr. Geoffrey Linnell, who owns a "Moth," is at present using a field that was prepared by the R.A.F. during the war for night landings, but never used. It is of 40 to 50 acres in extent, and only surrounded by low hedges. There are no trees. It is situated near the main Bedford-Northampton road, half a mile north of the village of Lavendon, and about two miles north-west of Turvey. Mr. Linnell kindly informs us that this field can be used at any time for landing purposes.

This new list given above, showing the total of registered private owners to be 57, may include an instance where a machine is not owned by the owner given. That would be through very recent exchanges which have not yet been notified to the Air Ministry.

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# LIGHT 'PLANE CLUBS

## LONDON AEROPLANE CLUB

Report for the week ending November 13.—Flying time, 20 hrs. 5 mins.; dual, 7 hrs. 55 mins.; solo, 10 hrs. 35 mins.; passenger flights, 1 hr. 35 mins.

Dual Instruction.—With Captain F. G. M. Sparks: R. Andrews, G. H. Craig, A. Fowler, A. J. Richardson, Rich Hayes, E. L. O. Baddeley, H. B. Michelmore, Miss Fletcher, F. A. I. Muntz., Dr. Cook.

With Captain S. L. F. St. Barbe: Rich Hayes, R. E. Edkins, G. E. Clair, E. A. Lingard, L. Rowson, Mrs. Cook.

Solo Flying.—W. Roche-Kelly, D. P. H. Esler, A. J. Richardson, E. C. T. Edwards, P. W. Hoare, G. W. Hall, J. J. Hofer, R. Sanders-Clark, A. F. Wallace, E. L. O. Baddeley, C. E. Murrell, G. C. Bonner, H. B. Michelmore, A. R. Ogston, E. E. Stammers, Captain Burt, Will Hay, F. A. I. Muntz, H. Solomon, M. L. Bramson.

Passenger Flights.—With Captain F. G. M. Sparks: E. D. Mumford, B. Carey, Miss Gaskell. With A. F. Wallace: Dr. R. M. Windeyer. With E. E. Stammers: H. B. Michelmore. With W. Hay: R. Sanders-Clark. On Sunday, 13th, P. W. Hoare successfully passed the tests for his Certificate and "A" Licence.

## BRISTOL & WESSEX AEROPLANE CLUB

FLYING Report for week ending November 5:—Flying time, 17 hrs. 25 mins.; instruction, 10 hrs. 5 mins.; solo, 6 hrs. 50 mins.; passenger, 25 mins.

Instruction (with Mr. E. B. W. Bartlett): Messrs. M. L. Alexander, A. E. Arnold, C. H. Brewer, T. H. Clarke, C. S. Clarke, G. Moon, J. H. Roberts, H. A.Tiarks.

Soloists under Instruction: Messrs. The Hon. H. C. H. Bathurst, A. H. Downes-Shaw, C. S. Clarke, R. A. Hall, S. K. Jopp, J. E. Tratman.

Passenger with Mr. Bartlett: Miss Wagg. With Mr. Hopper: Mr. C. Macormick.

Instruction was not possible during three days last week.

## HAMPSHIRE AEROPLANE CLUB

REPORT for week ending November 13.—Total flying time, 15 hrs. 15 mins.; dual, 5 hrs. 40 mins.; solo, licensed pilots; 3 hrs. 25 mins.; solo, unlicensed pilots, 4 hrs. 45 mins.; joy rides, with Flight.-Lieut. Thomson, 25 mins.; tests, 1 hr.

Dual (5 hrs. 40 mins.):—Mr. Hall, 1 hr. 45 mins.; Capt. Kirby, 35 mins.; Mr. Williamson, 55 mins.; Miss Home, 5 mins.; Lieut. Heinemann, 10 mins.; Lieut. Mandeville, 30 mins.; Mr. Dickson, 20 mins.; Mr. Wylde, 25 mins.; Mr. Boileau, 25 mins.

Solo.—Licensed, (3 hrs. 25 mins.). F./O. Southey, 50 mins.; Mr. Murray, 30 mins.; F./Lt. Boothman, 1 hr. 5 mins.; Mr. Fagan, 15 mins.; Capt. Yeatman, 10 mins.; Mr. Bowen, 35 mins.

Joy Rides (25 mins.).—With Flight.-Lieut. Thomson: Major Duff, 5 mins.; Mr. Sarel, 10 mins.; Mr. Bailey, 10 mins.

Solo.—Unlicensed (4 hrs. 45 mins.).—Mr. Cripps, 25 mins.; Mr. Fawkes, 20 mins.; Mr. Stanford, 50 mins.; Lieut. Graham, 1 hr.; Mr. Nicholson, 1 hr. 10 mins.; Miss Home, 30 mins.; Lieut. Heinemann, 15 mins.; Mr. Parker, 15 mins.

Joy Rides with other Pilots (2 hrs.).—With Mr. Murray: Dr. Murray, 10 mins.; Miss Sheridan, 10 mins. With Flight-Lieut. Boothman (dual) Mr. Gibbs, 15 mins.; Mr. Puttock, 20 mins.; With Flight-Lieut. Boothman: (joy-ride): Mr. Dallmeyer, 10 mins.; Mrs. Waterman, 10 mins.; With Capt. Yeatman: Miss Fletcher, 10 mins. With Mr. Bowen: Mr. Collins, 10 mins.; Mrs. Gibbs, 15 mins.; Mr. Lovat, 10 mins.

Flight-Lieut. J. N. Boothman, who helped us in the first week of our flying existence, is now home on leave from Iraq, and he kindly assisted on Sunday by giving instruction to several pupils. Very high winds on every day except Sunday restricted our activities.

## LANCASHIRE AERO CLUB

REPORT for fortnight ending November 12.—Flying time, 30 hrs. 35 mins. Instruction, 10 hrs. 40 mins. Solo flights, 13 hrs. 5 mins. Passenger flights, 4 hrs. Tests, 2 hrs. 50 mins.

Instruction (with Mr. Brown): Messrs. Gort, Allott, Agar, Rowley, Ruddy, Anderson, Hall, Browning, Heath, Gerrard, Slack, Barlow, Michelson, Ellis, Miss Brown, Miss Baerlein. (With Mr. Cantrill): Messrs. Nelson, Caldecott, Williams, Gort, Browning, Fallon, Davidson. (With Mr. Scholes): Messrs. Rowley and Riley.

Soloists (under instruction): Messrs. Harber, Rowley, Ruddy, Caldecott, Meads, Anderson and Gerrard.

Pilots: Messrs. Costa, Goodfellow, Williams, Lacayo, Crosthwaite, Leeming, Twemlow, Ward, Nelson, Michelson, Miss Brown.

Passengers (with Mr. Cantrill): Messrs. Preece and Pearson. (With Mr. Costa): Messrs. Callaghan, Brams and Anderson. (With Mr. Goodfellow): Mr. Hall. (With Mr. Nelson): Miss Armstrong. (With Mr. Brown): Messrs. Reid and Rodman. (With Mr. Twemlow): Mrs. Twemlow, Mr. Allott (With Mr. Williams): Messrs. Woodhead and Allen. (With Mr. Lacayo): Mr. Caldecott.

Really life is very quiet these days, and there has not even been a good gale to report, let alone a good crash during the past fortnight. Weather has been wet to foggy, and cold to boggy.

Mr. Meads did his height test last week and Messrs. Ruddy and Gerrard accomplished their first solo flights, all without damage to personnel or material.

Mr. Twemlow has the distinction of being our first A licence pilot to complete 20 hrs. flying since the new Air Ministry agreement came into force, and has thus earned his full subsidy for the club, in reward for which his future flying will cost him an extra 10s. an hour. Other A Licence pilots are being more cautious and our Scotch member, who had worked out that he could do 4 mins. 30 secs. a day throughout the year is very peeved because he'd had to pay for 5 mins. each time.

## NEWCASTLE-UPON-TYNE AERO CLUB

FLYING report for week ending November 13.—Total, 24 hrs. 10 mins. Instruction, 7 hrs. 15 mins. Soloists, 7 hrs. 55 mins. "A" Pilots, 6 hrs. 55 mins. Tests, 1 hr. Passengers, 1 hr. 5 mins.

Instruction (with Mr. J. D. Parkinson): Miss Leathart, Miss Rambaut, Messrs. V. Heaton, J. D. Irving, Dr. Alderson, Messrs. Hayton, Robertson, Glenny, DePledge, Griffiths.

Soloists: Messrs. Glenny, DePledge, Robertson, Shaw, Wilson, Turnbull, Irving, Mrs. Heslop.

Passengers (with Miss Leathart), Mr. Tomkins. (With Mr. C. Thompson): Mrs. Heslop. (With Mr. H. Ellis): Mr. Fairless, Mr. A. Bell. (With Mr. R. N. Thompson): Mr. Griffiths, Mr. Lawson. (With Mr. Parkinson): Mr. Oakes. (With Mr. A. Bell): Mr. Robertson. (With Dr. Dixon): Miss Dixon.

Mr. J. E. Glenny carried out the tests for his Aviator's Certificate on Sunday, putting up an exceedingly good show in both practical tests.

The Club's Annual Dance takes place on Friday the 19th, and the interest taken in it gives confidence that it will be as great a success, social and financial, as on previous occasions.

## NORFOLK & NORWICH AERO CLUB

REPORT for week ending Sunday, November 13.—Total flying time, 8 hrs. 20 mins.

Instruction with Capt. G. F. Lines: Messrs. N. Lindley, R. Harmer, G. F. Surtees, A. F. Patton, H. Meager. H. Mack, G. Norse, C. Gowing.

Soloists: Messrs. W. P. Cubit, R. Harmer, W. A. Ramsay, H. Pank, C. Gowing, F. Gough.

Passengers: Mrs. F. Gough.

The weather has been very unfavourable during the last week and extremely cold.

The "Moth" has been in dock again, Mr. C. Gowing tipped it up when trying to take off, a new propeller was all that was required to put her in order.

## YORKSHIRE AEROPLANE CLUB

REPORT for week ending November 12.—Flying time, 21 hrs. 5 mins. Instruction, 14 hrs. 15 mins.; soloinsts, 4 hrs. 20 mins.; passengers, 2 hrs. 30 mins.

Instruction (with Capt. Beck): Miss Woodhead, Miss Watson, Messrs. Ramsden, Brown, H. Crowther, Ward, Humphries, Bell, Ellis, Evans, Pierce, Jackson, Clayton, Batcock.

Solo Instruction: Messrs. Brown, H. Crowther, Atcherley, Ellison, Lister.

"A" Pilots: Messrs. Thomson, Wilson, Wood, Dawson, Mann, Paget.

Passengers.—With Capt. Beck: Miss Connatty, Wood. With Mr. Thomson: Mr. Clark. With Capt. Paget: Messrs. Brackenbury, Thomson, Coles. With Mr. Wood: Mr. Ellison, Miss Hardwick.

This has been a grand week, for not only have the flying hours been increased, but we have also added Messrs. Brown and Crowther to the solo list. Unfortunately, bad weather prevented two other pupils from joining the "elite."

Sir Sefton Brancker arrived on Thursday with Capt. Paget in a "Widgeon," and left on Saturday morning, and the machine excited great interest, and much favourable comment amongst the members.

Flying Officer Atcherley arrived in Lady Heath's SE5 to spend the week-end with his family, and landed in the ditch, but without damage. This exhibition is quite in keeping with the landing display which was being given that afternoon.

One of our members gave a practical demonstration of stopping propellors with one hand. He hopes to fly again shortly.

# THE IV. INTERNATIONAL AIR CONGRESS

THE fourth of the series of International Air Conferences was held this year in Rome, and lasted from October 24 to October 30. The Italian Conference was extremely well organised, both as regards the social side and from the point of the papers presented. The inauguration was held in the Senatorial Palace at Rome on October 24, Signor Mussolini presiding, and welcoming the visitors. In the afternoon there was a reception in the Capitol by His Excellency the Governor of Rome.

The subjects discussed were divided into various sections, such as Air Navigation, Air Touring, and Propaganda; Scientific section; Technical section; Legal section; and Medical section.

Some highly interesting papers were presented under the various sections, and it is obviously impossible for us to refer to more than a very few, and to these only by way of very brief summaries. The papers were printed in Italian, French and English, and visitors were given copies, as well as summaries of all the papers in either of the three languages.

In the section dealing with air navigation, a great number of papers were presented. It is rather regrettable that no English paper was read in this section. Col. E. V. Clark presented a very interesting paper on "Commercial Aeroplanes in the United States," in which he dealt with the effects which the fact that America is confining herself almost entirely to mail routes has had on the development of machines.

Maj. R. van Crombrugge dealt with commercial aviation in Belgian Congo, where the King Albert air line operated by the S.A.B.E.N.A. company is doing some really excellent work, using Belgian-built Handley-Page biplanes.

To the scientific section, Maj. H. W. Wimperis contributed a very good paper on "The Progress of Aeronautical Research in Great Britain," in which he outlined the organisation of research in this country, and gave a few examples of the more interesting subjects of research now being carried out, such as on the slotted wing, the tailless aeroplane, the rotating wing aeroplane, supercharged engines, and seaplane work.

Of other papers in this section, one by C. Pallavicino on "Tracing of Wing Profiles, and the Connection of Wing with Fuselage," was of considerable interest to such of our readers as have followed Mr. North's articles in THE AIRCRAFT ENGINEER. Mr. Pallavicino outlined a method of tracing a centre line curvature from a group of good symmetrical profiles, using a curve which differed little from a semi-cubic parabola instead of using the circular arc, as is more usually done. On the subject of interference, the author described how, by suitably altering the angle between the wing surface and the sides of the fuselage, etc., the aerodynamic efficiency was increased by 13 per cent. in the case of a monoplane, and by 10 per cent. for a biplane.

The Technical Section, as was to be expected, produced by far the greatest number of papers. Again it was unfortunate that not a single British paper was included. Mr. F. Handley Page is known to have attended the Congress, and it was probably only his well-known modesty which prevented him from reading a paper before such a distinguished gathering.

To give our readers an idea of the variety of subjects discussed, we give below a list of the authors and the papers presented by them.

*Air Navigation Section.*—L. Acampora: Formula for the Classification of Commercial Aircraft. L. Adler: Civil Aerodromes in Towns. T. Biffi: Means employed in Airship Navigation. P. Boutiron: The coming Evolution of Marine Aircraft and their Suitability for the great Sea Airways in the Future. L. Breguet: Calculation of the Cost of Aerial Transport. S. Cacopardo: Prohibited Zones. E. V. Clark: Commercial Aeroplanes in the United States of America. E. Faludi: The Problem of Civil Airports. P. Freri: Safety in the Air (the parachute). E. Fusco: International Statistics of Commercial Air Traffic. O. Hueffer: Utilisation of Mercantile Ports for Civil Air Navigation. J. Lobo d'Avila Lima: Portugal's Contribution to the Development of Air Navigation. E. Mellini: Civil Air Navigation in Relation to Railway and Postal Transport. C. Musto: Necessity of Organising Air Traffic. D. Naselli: Captains and Engineers of Air Lines. E. Rocco: Hydroaviation, Hydroports of some Italian Civil Lines. S.I.S.A.: Report of a Special Type of Fluvial Airport for the Triest-Turin Airline. A. Solaro: Air Centres for Touriug in Italy. L. Tarantini: Form and Dimensions of Landing Grounds. L. Tarantini: Proposed Modifications in the Convention for the Regulation of Air Navigation. F. Troiani: The Opening of a New Airport in Rome. R. Van Crombrugge: Aviation on the Congo. The "King Albert" Airway. M. Ionkheer van den Berch van Heemstede: Memorandum on the Returns from Aerial Undertakings.

*Scientific Section.*—C. Alippi: A General Demonstration of the Paradox of Euler, and some Thermo-aerodynamic Considerations. R. Bilancini and L. Borriello: Provisional Draft for a Meteorological Log-Book. M. Boel: Discarding of Velocity in Birds. D. Camiciotti: The Aerological Station of Vigna di Valle. G. Elliot: Reduction to Sea Level of the Atmospheric Pressure by Means of Graphic-mechanical Processes. F. Eredia: The Exploration of the Atmosphere by Means of Kites and Balloons. C. Ferrari: Experiences with a Self-Rotating Screw. M. Giraul: Notes on the Variation of Pressures and Velocity in a Viscous Fluid. M. Goeta: Plan for a Modern Laboratory for the Scientific Development of Thermo-Aerodynamics. E. Herrera: A Serious Inconvenience in Open Aerodynamic Tunnels. V. F. Hess: The Discovery of Cosmic Radiation on the Occasion of Balloon Ascents of the Austrian Aero Club in 1911 and 1912. A. Iotti da Badia Polesine: Remarks on Aerodynamics and Physiology of the Flight of Birds. S. Kawada: On the fundamental Principles of the Vortex Theory of the Airscrew. C. Pallavicino: Tracing of Wing Profiles, and the Connection of Wing with Fuselage. M. Panetti: Deduction of the Polar of a Machine from the Polar of the Principal Supporting Surface. E. Pistolesi: Contribution to the Study of an Airscrew in a Lateral Wind. P. Puvrez: Improved Means of Measuring used in the Wind Tunnel at Rhode St. Genèse (Belgium). Scuola Ingegneria Torino: Logarithmic Diagrams of Screws. Grouped into 25 families with Reference to the Ratio of the Pitch to the Diameter. T. Suhara: Distribution and Oscillation of the Temperature in the Principal Parts of an Aeroplane Engine. Van der Hegge Zyhen: Experiments on the Distribution of the Velocity. Pressure on the Strata Surrounding a Wing for a two-dimensional Current. Visani: The Use of Aerological Observations for Defining the Anemological Regimen of a Region. K. Wada: On Frictional Resistance on Fluid of Small Viscosity. H. W. Wimperis: The Progress of Aeronautical Research in Great Britain.

*Technical Section.*—G. Almagia: Launching of Aircraft—The Catapult. E. Angeloni. Some Considerations with Respect to Flying at Extremely High Altitudes. S. Bedendo: Schemes for Determining the Reaction of the Controls. L. Biondi: Tests in Flight of Aircraft Controlled with Results from Ground Tests. N. Bonaretti: Notes on Elektron and Its Use. F. Bonifacio: Problem Connected with Safety, Means of Sauvetage and various Apparatics on Board Commercial Aircraft. L. Cagnotto: Catapults for Launching of Hydroplanes. M. Corelli: Inquiry about some Experiments and Particulars Made for the Testing of Aviation Petrol. D. Cosci: Calculations of the Functional Performances of an Airscrew Based on the Consideration of the Effective Angle of Incidence. R. de Glymes: Application of the Airscrew "Schul" to Aircraft. G. Dompê: Estimating the Baricentric Vertical of the Gas Volume of an Airship. P. Dupont: Introduction to the Study of the Biplane. Mutual Action of two Non-contiguous Bodies. A. Eula and A. Viti: Calculation of the Radius of Action of Aeroplanes and Recent Transoceanic Flights. F. Franck: Disturbances Caused by Ignition Circuits in the Wireless Circuits on Aeroplanes. G. Gabrielli: An Approximate Method of Projecting Airscrews. N. Galante: On the Calculation of Long Compressed Prisms along the Axis. Grard: Light and Ultra-Light Alloys in the Thermical Zone of Work in Aviation Material. C. Gustosa: What is Required to Facilitate the Development of multi-motor Seaplanes. F. Haus: Influence of Static Longitudinal Stability on the Trajectory of Aeroplanes. F. Haus: Concerning Light Metals. G. Lehr: Supercharged and Subcharged Aircraft Engines. A. Levi Cases: Particular Problems Concerning the General Construction of the Heavy Oil Motors as Regards Air Navigation. L. Lo Curto: Characteristics of the Principal Light Alloys. G. Magaldi: Aerial Navigation and Launching Mechanism. G. Montelucci: On the Protection of Iron by Use of Cadmium. Use of the Eutectic Alloy Cadmium-Zinc for the Coating of Steel Wires for High-Resistance Cables. E. Pistolesi: Calculation of the Elastic Line of the Propeller. G. B. Pitscheider: Restrictions on the Choice of Materials Used in Aeronautical Construction. E. Puvrez: Contribution to the Problem of the Choosing of Wings. F. H. Reyneker: Some Remarks on the Principles Underlying the Determination of the Load Factors Employed in Calculating the Resistance of Aircraft. L. Sante da Rios: On the Lift of an Air-Screw with a Ring. L. Stipa: Auto-Cooling Motors for High Altitudes. Van der Mass: Some Experiments on the Longitudinal Stability of Aeroplanes. F. E. Wolf: Some Observations about the Properties of Materials for Construction, as an Estimating Basis for Aircraft. P. Zonta: On the Technics of Radio Apparatus on Board.

FLIGHT

# CORRESPONDENCE

*The Editor does not hold himself responsible for opinions expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for insertion in these columns.*

## COMPRESSION-IGNITION ENGINES

**[2165]** Many I.C. Motor Research workers like myself were disappointed with the paper read by Mr. H. B. Taylor on the above subject. We attend such meetings to receive enlightenment. Instead the audience was served with information known to most of us over 15 years ago. A shroud of mystery and secrecy was cleverly thrown over the meeting regarding this " hush hush " motor, by some able official speakers, but those of us " in the know " could clearly see it was the usual official window dressing and whitewash, backed by nothing interesting or original. As a research worker for over 16 years, and a patentee of numerous types of valve gears for I.C. motors, and having spent over two years at Farnborough during the war, and having been in close touch with Government experts in all the fighting services almost continuously ever since, I claim to know something about the mentality of the official expert, and the huge sums of money squandered at Farnborough, and in other departments of the fighting services on white elephants. In reading Mr. Taylor's paper and studying the drawing of the experimental motor used, I have no hesitation in saying that the Air Ministry is pursuing a greater phantom than the famous phantom Salmon rotary valve motor built at Farnborough during the war, which was going to revolutionise flying, but which I laid low in the technical Press when the experiments were started. The experiments were, however, carried on for a considerable time with disastrous consequences to the taxpayers. In criticising this paper, I will not go into the many difficulties surrounding fuel injection, etc., at high speed, they are well known to practical engineers. I will confine my remarks to the overhead valve gear fitted. Most of us are agreed that the aero engine of the future must be able to function for days and weeks at high speed without stopping, like a marine engine, further, the overhaul and repair bill must be on a par with it. Mr. Taylor's position at Farnborough must make him conversant with the serious, excessive; and rapid wear developed on the exhaust valves, guides, rocker arms, push rods, etc., due to side thrust, caused by the radial movement of the rocker arms, and lack of perfect lubrication. Sticky and broken exhaust valves are also a source of trouble, and cause great loss of life, especially in motors fitted with domed combustion chambers (as illustrated in his experimental engine) which distort due to the coal gas being taken in at one side of the cylinder and the red-hot exhaust being expelled at the other side. A 12-cylinder 650 h.p. motor fitted with this type of cylinder has over 450 pieces in its valve gear alone. Is it to be wondered at that the Air Force requires a great number of ground men to keep such motors in running condition ? Is this type of motor suitable for rapid overhaul in war time ? The experimental motor shown cannot be classed as a clean simple, business-like proposition. It gives one the impression of being a crude copy of the type of compression ignition motor in use many years ago. It did not surprise me to hear the lecturer say that it broke down many times. Away back in 1907 and 1908, when experimenting with and selling model motors for aeroplanes, I found it comparatively easy to get good results with single-cylinder engines of large bore, but when testing engines of small bore, I found them troublesome to keep running perfectly, due to sensitive carburation. Mr. Taylor will find the same trouble when he comes down to smaller bores, which he will have to do, as the present size he is using is excessive. The type of valve gear shown is wrong in theory and practice for effectively vapourising heavy fuels for high-speed aero engines, and the sooner the engine experts at the Air Ministry wake up to this fact, the sooner the perfect heavy fuel motor will be evolved. It is unscientific practice to draw the cool air and vapour through a cool port and expel the flaming exhaust through a red hot port, the order should be reversed ; this can only be done by making one small positively operated valve per cylinder control the two ports. In considering the question of a heavy fuel motor, I see no difficulty in vapourinsing the fuel perfectly through a special carburettor, provided a new type of valve gear and cylinder head are fitted which will utilise about 55 per cent. of the heat energy now thrown away in the exhaust of the present type. This is within the bounds of possibility, and I would suggest to Mr. Taylor that he first solve the problem of reclaiming this heat energy (which I have done) then he will find it a simple matter to vapourise heavy fuel with this reclaimed heat, at a compression ratio of 9 to 1, without injection, and fire the charge like a petrol motor with a special type of sparking plug and coil. As is well known, this cannot be done with poppet or sleeve valve motors because the vapour is drawn upwards from the carburettor through cold ports, and as the fuel is heavier than air it quickly separates itself from the air and takes the shortest route which is along the bottom of the passages, reaching the cylinders in unequal quantities, this causes roughness in running. With the valve gear I have designed and patented, the vapour is drawn downwards directly from the carburettor into an expansion box extending the full length of the motor and is always at a constant temperature. It is then distributed equally to each cylinder from this box. This simple system of reclaiming lost heat energy introduces the possibility of running an ordinary petrol motor on shale oil with a modified carburettor, valve gear, detachable head and ignition system. The motor need not be built heavier to run at this higher compression ratio because the strains will not be as great as the strains on a poppet valve motor when it is pre-igniting. In 1915, I fitted a De Dion car with a single-cylinder motor of this type. It ran perfectly either on petrol or workshop paraffin, price 6*d*. per gallon. The motor was fitted with an ordinary No. 30 Zenith petrol carburettor without heating the inlet. It gave off no moisture or smoke from the exhaust. With this encouraging result, I intended to proceed further with my experiments, but the War Office thought I would be better employed doing fatigue duty in the workshops at home and abroad. When I returned from France in 1919 and got demobilised, I found the garage proprietor had gone, also my experimental car ; since then I have not been able to continue my experiments. The Air Ministry are conversant with my motor, but as they are afraid to take risks with anything new, they play for safety by following other experimenters when doing research work, as is evident from Mr. Taylor's paper. This appears to me to be a retrograde policy. Should not a well thought out simple scientific design be given more consideration even if it has not emanated from the highbrows at the Air Ministry, especially as it is acknowledged by two leading British research chemists on motor fuels to be the solution for pre-ignition, detonation and carbon monoxide gas in the exhaust. Further, a 700 h.p. 12-cylinder vertical parallel geared motor built to this design has only 52 pieces in its positively operated valve gear, and as the valves and combustion chambers temperatures are never excessive, high speeds equalling the recent Italian seaplane record of 313 m.p.h. could be kept up indefinitely, an impossibility with a poppet valve motor, the exhaust valves of which are quickly destroyed by high velocity exhaust gas. I am not in agreement with Mr. Taylor that the two-cycle compression ignition motor presents possibilities for high speed aero engines. Assuming the speed of the engine to be about 1,200 r.p.m., how does he propose to open and close the fuel injection valve 1,200 times per minute while the crank pin travels through 80° ? At this speed will not the compression in the cylinder tend to blow the fuel back before the fuel valve closes ? Inertia forces and wear on such a high speed sensitive injection valve will become serious problems to solve. Further, the power stroke of a two-cycle motor is not effective for more than half a cycle whereas the power stroke of a well designed four-cycle motor fitted with a scientifically designed positively operated large ported valve gear is effective for over three-quarters of the cycle. When Mr. Taylor has seriously considered the above points, I do not think he will be so enamoured with his high speed two-cycle proposition. In 1915, I patented a two-cycle aeroplane engine working on fuel injection but when I came up against the above problems I abandoned it for my present type of four-cycle motor.

West Hampstead. WILLIAM COCHRANE
November 14, 1927.

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**French Magazines for Sale**

A READER of FLIGHT wishes to dispose of the war issues, 76 in all, of *La Guerre Aerienne*, all in good condition, as well as 10 issues of *Documents de l'Armee*. Will any reader interested in these please communicate with the Editor, who will forward all enquiries to the owner of the documents ?

# AIRISMS FROM THE FOUR WINDS

**Great Flying-Boat Cruise**

THE R.A.F. "Southampton" flying-boats reached Basra on November 10, from Baghdad. The four machines made the next stage to Bushire on November 12, six other Service machines accompanying them. Then on November 14 the four "Southamptons" arrived at Hanjam Island, on the Persian Gulf.

**Belgian Flight Fails**

Two Belgian pilots, Lieut. Medaets and Lieut. Verhaegen, left Wevelgein Aerodrome, in Flanders, on November 11, with the object of flying non-stop to the Belgium Congo. News was received later of their forced landing at Le Fertesur-Aube, in France, which seriously injured themselves and badly damaged the machine.

**German Atlantic Flight**

THE D 1220 Heinkel seaplane capsized when attempting to leave the Azores for Newfoundland, on November 13. The crew were uninjured, and the machine was towed to the harbour.

**The West Indies and Aviation**

THE report of the West Indian Air Transport Committee on the prospects of air transport in the West Indies has been issued. The Committee, of which Sir Sefton Brancker is chairman, have decided that an air service for the whole area was not yet commercially practicable, and that British Guiana (Georgetown) and Trinidad (Port of Spain) were the British centres which offer at present the most favourable prospects for regular air services. The Committee indicate where these air lines should run and the good possibilities for air survey in the West Indies generally.

**S5 Arrives**

THE Supermarine Napier S5 reached London from Venice on November 14. It will be on view at the Horse Guards Parade towards the end of this week.

**Test Pilot's Mishap**

CAPT. COURTNEY left Calshot for Friedrichshaven on November 13, in his Dornier-Wal flying-boat, and came down at Cologne. His machine was carried away by a strong current, collided with a steam tug, and was damaged.

**Air Survey in Northern Rhodesia**

APROPOS our paragraph last week on air survey in Northern Rhodesia, the Aircraft Operating Co. has declared a contract with the Benguella Railway Co. whereby they are about to undertake an air survey of that part of the Lungwe Bungu River in Angola territory adjoining Rhodesia. Permission from the Portuguese authorities has already been obtained for carrying out the work.

This new contract will form an extension of the Zambesi air survey contract, which the company is now doing for the Government in Northern Rhodesia, and towards the cost of which the Benguella Railway Co. are also contributing. Under that contract the Aircraft Operating Co. are making an air survey of the Lungwe Bungu River, up to the Angola boundary. The combined operation will form a comprehensive scheme for the investigation of the Zambesi and Lungwe Bungu Rivers as a possible means of communication between Livingstone and Lobito Bay. The company's astronomical unit left N'Changa, the present headquarters of the expedition, *en route* for the Zambesi, on October 8. They will work down the Kabompo River, fixing control points, then up the Lungwe Bungu River, and finally down the Zambesi to Livingstone. It is expected that flying operations will start about the beginning of December.

**Pilotless Aircraft**

A BREGUET biplane was recently flown many times in France under wireless control. France has subsequently decided to accept this controlling method. Such experiments have been tried on many occasions by various countries.

**One Million Air Subsidy!**

THE French Finance Committee has consented to the payment of nearly £1,000,000 to the Latécoere Co. in 1928 for the establishment of an air service between France and South America.

**Emir of Transjordan Decorated**

FIELD-MARSHAL LORD PLUMER, High Commissioner for Palestine, invested the Emir of Transjordan with insignia of a K.C.M.G. on November 8 at Amman.

**A Sacrifice**

FLYING-OFFICER C. MACKENZIE-RICHARDS was killed on November 9 at East Grinstead, after leaping from his R.A.F. machine with a parachute. His observer, Mr. H. N. Green, made a safe descent. They were flying from Croydon to Farnborough and lost their position owing to compass defects. Lack of petrol then made a landing urgent, but as a suitable place could not be found the descent by parachute was decided upon. It is clear from the evidence that F./O. Mackenzie-Richards lost his life through his concern for the safety of Mr. Green, who had no previous experience of parachute descents. He delayed his own jump until the observer was safe and was then too low, consequently hitting the ground before the parachute opened.

**Welsh Air Race?**

SWANSEA is endeavouring to arrange an annual air race over a triangular course between its own town, Weston and Ilfracombe.

**Well Deserved**

LIEUT. R. R. BENTLEY, M.C., has been awarded the Air Force Cross for his recent flight from London to Cape Town in a D.H. "Moth."

["FLIGHT" *Photograph*

**"CIRRUS" SERVICE: Capt. T. N. Stack has now joined A.D.C. Aircraft, and has been equipped with a de Havilland "Moth" on which he visits the light 'plane clubs and private owners so as to ensure that quick and satisfactory service is given. Stack's machine is painted white and red, like that on which he flew to India, and carries the registration letters G-EBUF.**

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# THE ROYAL AIR FORCE

*London Gazette, November 8, 1927.*

*General Duties Branch*

Flight-Lieut. R. S. Greenslade is granted a permanent commn. in this rank; Nov. 1, 1926. *Gazette* of Sept. 9 transferring Flying Officer R. N. Hesketh to Reserve is cancelled. The following are transferred to Reserve, Class A:—Flying Officer K. K. Brown, Flying Officer A. H. Grace, Flying Officer E. J. H. Wright; Nov. 13. Flight-Lieut. F. A. Swoffer, M.B.E.; Nov. 14. Flying Officer G. C. A. Armstrong ceases to be seconded for service as Aide-de-Camp to the Governor of South Australia; Oct. 31. Flying Officer J. F. Lawn takes rank and precedence as if his appointment as Flying Officer bore date August 3, immediately following J. B. Buckley, Sub-Lieut., R.N., Flying Officer R.A.F., on gradation list; reduction takes effect from Oct. 26. P. B. McDonald, Lieut.R.N., Flying Officer R.A.F., relinquishes his temp. comm. on ceasing to be attached to R.A.F.; Oct. 24. Flying Officer L. E. Cutforth (Lieut., R.A.) relinquishes his temp. commn. on return to Army duty; Nov. 8.

The following Pilot Officers relinquish their short service commns. on account of ill-health (Nov. 9):—P. V. Anson, L. K. Mundy. The following resign their short service commns.:—Flying Officer E. H. Collinson, M.C. (Major, East Surrey Regiment, R.A.R.O.); Oct. 31. Pilot Officer W. S. Townend; Oct. 24.

*Stores Branch*

The following Flying Officers are granted permanent commns. in this rank with effect from the dates stated, on completion of probationary service:—J. R. R. Harvey, M.M.; Oct. 1, 1926. A. E. Connolly; Oct. 25, 1926.

Pilot Officer on probation Robert Stanley Sawyer is confirmed in rank and promoted to rank of Flying Officer; Oct. 9.

*Medical Branch*

Flying Officer W. D. McKeown, M.B., is promoted to rank of Flight-Lieutenant; Nov. 3.

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### RESERVE OF AIR FORCE OFFICERS

*General Duties Branch*

H. Haigh is granted a commn. in Class B.B as Pilot Officer on probation; Nov. 8. Pilot Officer E. I. C. Wyllie is promoted to rank of Flying Officer; Nov. 3. The following officers on probation are confirmed in rank (Nov. 3):—Sqdn.-Ldr. C. D. Stewart, Pilot Officer F. H. Dight. Flying Officer N. M. Ffrench is transferred from Class A to Class C; Nov. 3.

The following relinquish their commns. on completion of service:—*Flying Officers.*—W. E. de B. Diamond; Sept. 16. C. B. Collins; Sept. 18. F. Tymms, M.C.; Oct. 1. *Pilot Officer* J. Woods; July 22.

Flying Officer A. J. Insall relinquishes his commn. on completion of service, and is permitted to retain his rank; Oct. 24. Flight-Lieut. J. G. Horne relinquishes his commn. on account of ill-health, and is permitted to retain his rank; Nov. 9.

## ROYAL AIR FORCE INTELLIGENCE

**Appointments.**—The following appointments in the Royal Air Force are notified:—

*General Duties Branch*

*Group Captain* C. E. H. Rathborne, D.S.O., to R.A.F. Station, Upper Heyford, to command, 25.10.27.

*Wing Commanders:* A. G. R. Garrod, M.C., D.F.C., to R.A.F. Station, North Weald, to command, 27.9.27. G. I. Carmichael, D.S.O., A.F.C., to R.A.F. Depot, Uxbridge, Supernumerary, 17.11.27. R. H. Peck, O.B.E., to Air Ministry, Directorate of Operations and Intelligence, for Air Staff duties, 17.11.27. A. T. Harris, O.B.E., A.F.C., to R.A.F. Depot, Uxbridge, Supernumerary, 21.11.27.

*Squadron Leaders:* J. H. O. Jones to No. 10 Group, H.Q., Lee-on-Solent, 24.9.27. D. E. Stodart, D.S.O., D.F.C., to No. 9 Sqdn., Manston, 7.11.27. E. D. Johnson, A.F.C., to No. 3 Sqdn., Upavon, 15.9.27. F. R. Alford, M.C., to No. 7 Sqdn., Worthy Down, 7.11.27.

*Flight Lieutenants:* R. C. Savery, D.F.C., to Elec. and Wireless Sch., Flowerdown, 3.11.27. T. Henderson, M.C., A.F.C., to R.A.F. Depot, Uxbridge, 7.10.27. T. S. Ivens to No. 208 Sqdn., Middle East, 26.10.27. S. N. Webster, A.F.C., to No. 15 Sqdn., Martlesham Heath, 9.11.27. E. D. Davis, to Armament and Gunnery Sch., Eastchurch, 10.10.27. A. L. A. Perry-Keene, to R.A.F. Depot, Uxbridge, 31.10.27. K. B. Lloyd, A.F.C., to Aircraft Depot, Iraq, 21.10.27. E. D. Barnes, to No. 30 Sqdn., Iraq, 22.10.27. F. C. B. Savile, to R.A.F. Station, Upper Heyford, 25.10.27. O. E. Worsley, to Central Flying Sch., Wittering, 20.11.27. G. G. H. Du Boulay, to Superintendent of R.A.F. Reserve, Northolt, 16.11.27.

*Flying Officers:* J. F. Lawn, to No. 56 Sqdn., North Weald, 31.10.27. F. Porter, to No. 13 Sqdn., Andover, 1.12.27. M. C. W. O. Flint, to No. 30 Sqdn., Iraq, 20.10.27. J. H. Powle, to No. 5 Sqdn., India, 12.10.27. H. S. Martin, to Aircraft Depot, India, 10.10.27. R. N. Hesketh, to No. 1 Sch., of Tech. Training (Apprentices), Halton, 14.11.27. C. J. Stone, to R.A.F. Depot, Uxbridge, 11. 11.27. E. C. Barlow, to Aircraft Depot, Iraq, 25.10.27. K. C. Garvie, to No. 30 Sqdn., Iraq, 22.10.27. (Hon. Flight Lieutenant) W. F. Humphrey, to H.Q., Iraq, 21.10.27.

*Pilot Officer* H. F. Gower, to No. 3 Sqdn., Upavon, 2.11.27.

*Stores Branch*

*Flight Lieutenants:* T. E. Drowley, to R.A.F. Station, Upper Heyford, 25.10.27. W. St. J. Littlewood, to Station H.Q., Bircham Newton, 22.11.27.

*Flying Officer* R. T. Rich, to No. 1 Sch. of Tech. Training (Apprentices), Halton, 1.11.27.

*Accountant Branch*

*Flying Officers:* C. F. Goatcher, to H.Q., Middle East, 26.10.27. H. J. Titherington, to R.A.F. Base and Stores Depot, Iraq, 13.10.27. K. A. Jackman, to Station Accounts Office, Hinadi, instead of to Aircraft Depot, Iraq, as previously notified, 20.9.27. R. G. D. Thomas, to No. 25 Sqdn., Hawkinge, 22.11.27.

*Medical Branch*

*Wing Commander* A. S. Glynn, M.B., to Palestine General Hospital, 22.10.27.

*Flight Lieutenants:* J. D. Leahy, M.C., M.B., B.A., to R.A.F. Station, Upper Heyford, 14.11.27. C. T. O'Neill, O.B.E., M.B., to No. 20 Sqdn., India, 20.9.27. A. Harvey, M.B., to No. 47 Sqdn., Middle East, 10.10.27.

*Flight Lieutenant (Dental)* M. J. O'Reilly, to H.Q., Iraq, 18.10.27.

*Flying Officers:* J. Hill, M.B., to Home Aircraft Depot, Henlow, 26.10.27. J. D'I. Rear, to R.A.F. Pathological Lab., Halton, 9.11.27. S. F. Heatley, M.B., B.A., to R.A.F. Depot, Uxbridge, 9.11.27. E. J. Jenkins, to No. 45 Sqdn., Middle East, 15.10.27.

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### NAVAL APPOINTMENTS

The following appointments have been made by the Admiralty:—

*Lieutenant* (*Flying Officer, R.A.F.*) the Hon. J. M. Southwell, to *Hermes*, and for full flying duties in 404 flight (September 5), and to *Tamara*, and for full flying duties in 401 flight (on arrival at Hongkong).

*Lieutenants:* I. U. Martineau, H. P. Sears, V. F. Smyth, and D. G. F. W. Macintyre, to be attached to R.A.F. for period "A" (November 15).

*Sub-Lieutenants:* J. P. G. Bryant and H. P. Madden, to be attached to R.A.F. for period "A" (November 15).

## WAKEFIELD BOXING TOURNAMENT

THE R.A.F. Novices' boxing competitions for the Sir Charles Wakefield trophies were completed on November 3 at Henlow. The results of the finals were:—

**Seniors**

Fly-Weight:—Ac. Coleman (Cranwell) beat Ac. Palmer (Uxbridge) on points.

Bantam-Weight:—Ac. Johnson (Henlow) beat Ac. Green (Manston) on points.

Feather-Weight:—Ac. Holloway (Halton Admin.) beat Cpl. Lloyd (Halton Wing) on points.

Light-Weight:—Ac. Griffin (Manston) beat Ac. Cook (Uxbridge) on points.

Welter-Weight:—AA. Foley (Halton Wing) beat Ac. Buchanan (Manston) on points.

Middle-Weight:—L/AA. Clapp (Halton Wing) beat Ac. Osborne (Cranwell) on points.

Light-Heavy-Weight:—Ac. Higgins (Henlow) beat Cpl. Jackson (Halton Admin.) on points.

Heavy-Weight:—L/Ac. Twine (Henlow) knocked out AA. Bingham (Halton Wing) in 1st round.

**Other Ranks—Junior**

Fly-Weight:—Ac. Hunter (Calshot) beat L/Ac. Mosely (Tangmere) on points.

Bantam-Weight:—Ac. Steel (Shrewsbury) beat Ac. Trowman (Old Sarum), who damaged his hand in the 1st round.

Feather-Weight:—Ac. Older (Shrewsbury) knocked out Ac. Chinnery (Tangmere), the latter being allowed to fight again after being defeated by Ac. Borlum (Digby) last night, Borlum being disqualified as not being a novice.

Light-Weight:—Ac. Simpson (Shrewsbury) beat L/Ac. Izzard (Old Sarum), on points.

Welter-Weight:—Ac. Budge (Calshot) beat Ac. Wassell (Leuchars) on points.

Middle-Weight:—Ac. Souden (Leuchars) beat Sgt. Wilkins (Worthy Down) on points.

Light-Heavy-Weight:—Ac. West (Worthy Down) beat Ac. Porter (Shrewsbury), who retired with a damaged hand.

Heavy-Weight:—Ac. Morris (Leuchars) beat Ac. Cahalane (Shrewsbury) on points.

**Officers' Events**

Feather-Weight:—P/O A. T. Hazeldine (Digby) beat F/O R. O. Jones (Henlow) on points.

Light-Weights:—P/O M. H. Clare (Sealand) beat P/O W. T. Rogers (Henlow) in the 2nd round.

Welter-Weight:—P/O A. M. Stevens (Digby) beat F/Lt. F. T. Eades (Worthy Down) on points.

Middle-Weights:—F/O J. M. Cohu (Henlow) knocked out P/O A. D. Jones (Digby).

Heavy-Weight:—F/O G. R. Beamish (Farmborough) knocked out F/O Bruce-Bennett (Henlow).

**Team Placings**

Airmen Open Championships.—Henlow, 30; Manston, 29; Halton (Wing), 27; Halton (Admin.), 22; Cranwell, 20; Uxbridge, 17; Flowerdown, 13; Andover, 12.

Airmen Junior Championships.—Shrewsbury, 33; Leuchars, 30; Old Sarum 22; Calshot, 22; Worthy Down, 21; Tangmere, 15; Digby, 9.

Officers' Championships.—Digby, 22; Henlow, 21; Sealand, 13; Farnborough, 12; Worthy Down, 7; Old Sarum, 7; Manston, 6.

# IN PARLIAMENT

**Air Shed, Cardington**

COL. DAY, on November 9, asked the Secretary of State for Air whether tenders were invited for the erection of the new air shed at Cardington; and how many tenders were submitted to the Air Ministry for this work?

Sir Samuel Hoare: Six firms were invited to tender and four tenders were received.

**Fatal Accidents**

COL. DAY asked the number of fatal accidents that have taken place in the Royal Air Force from January 1 to the last convenient date; whether he can give comparative figures for the year 1926; and, in view of the number of fatalities, will he consider having a public inquiry held into all their causes?

Sir S. Hoare: As regards the first two parts of the question the number of fatal accidents in the Royal Air Force during the period January 1 to November 1, 1927, was 35; the number during the corresponding period of 1926 was 46. As regards the last part, no useful purpose would be served, I think, by the adoption of the suggestion put forward by the hon. member, who will no doubt remember that a very full statement on this subject was made in the House by the Prime Minister on March 10 last.

Col. Day: Is the right hon. baronet satisfied that all the machines used by his pilots are thoroughly up to date, and not of the old-fashioned kind?

Sir S. Hoare: Yes, generally I am satisfied. The greatest precaution is taken in inspection. Naturally, that is a question which we constantly have in mind, and I am satisfied upon it.

Capt. Garro-Jones: Have any steps been taken for the introduction of the new slotted wing device in the machines of the Air Force?

Sir S. Hoare: Yes. I myself am going to make a trial of it next week.

**Airship Construction**

MR. ROSE, on November 10, asked the Secretary of State for Air if he is now in a position to fix a date for the launching of the two 500,000,000 cub. ft. airships under construction at Cardington and Howden, respectively?

Sir S. Hoare: It is not possible to give firm dates at the present stage of the programme, but the indications are that both airships will be ready for flight by the autumn of next year.

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# AIR MINISTRY NOTICES

## NOTICES TO AIRMEN

**Low Flying in the Neighbourhood of Croydon Aerodrome**

Complaints from residents in the immediate neighbourhood of Croydon Aerodrome continue to be made regarding the low flying of aircraft. Pilots are warned that low flying over inhabited areas around the aerodrome must, as far as possible, be avoided, and that disciplinary measures will be taken against any pilot proved to have flown unnecessarily low in this neighbourhood. (No. 82 of 1927.)

## NOTICE TO GROUND ENGINEERS

**Engine Installation Requirements: Fire Prevention**

1. It has been decided that as from the date of this Notice renewals of Certificates of Airworthiness for Civil Aircraft cannot be recommended unless it can be established that the aircraft complies with the requirements outlined below:—

*Section I: Normal and Acrobatic Categories—[sub-divisions (a) to (e).*

(1) *Fireproof Bulkhead.*—(*a*) A fireproof bulkhead must be fitted in order to insulate the engine bay from the rest of the aircraft. In addition, adequate protection must be provided for the underside of the fuselage.

(*b*) When engines are fitted directly on to a wing, fireproof bulkheads must be fitted to insulate the engine effectively from all parts of the main plane structure.

In addition, adequate protection must be provided for the surfaces of the wing, and petrol and oil piping.

(*c*) When petrol tanks are fitted in engine wing nacelles, a fireproof bulkhead must be provided to isolate them.

(*d*) If structural bracing, engine controls, oil or other pipes are led through the bulkhead they must be properly bushed, except when they pass within 3 in. of the edge of the bulkhead. In that case bushing may be dispensed with provided that the hole in the bulkhead is of the minimum size to permit of the necessary movement of the part in question.

(*e*) All fuel tanks must be placed on the side of the bulkhead remote from the engine, and an air space left between the tanks and the bulkhead.

(*f*) All inflammable materials on the engine side of the bulkhead must be rendered fireproof in an approved manner.

(2) *Pipes.* (*a*) Pipes in the induction system inside the cowling must be provided with air-tight joints, and carburettor air intakes must be laid outside the fuselage.

(*b*) Rubber tubing or rubber joints must not be used on the engine side of the bulkhead except in the oil and water systems. If a flexible pipe or joint is necessary in the fuel system, a fireproof material must be employed and adequate precautions must be taken to prevent collapse or bursting under load.

(*c*) A fuel pipe must not pass within 4 in. of a magneto or exhaust pipe. Exhaust pipes must be reasonably free from the possibility of gas leakage, and the exits must be so arranged that the gases do not impinge on wires, struts or other structural components. Adequate clearance must be provided to prevent scorching.

(*d*) No exhaust pipes, muffs or jackets may be fitted inside the fuselage, except in the engine bay.

(3) *Draining.*—Carburettor air intakes must be properly drained at all normal attitudes of the aircraft.

(4) *Electrical Installations.*—(*a*) Accumulators must be of the wholly non-flame or non-flame top type, and must be contained in leak-proof boxes which insulate the celluloid sides from the air. They must be kept as far as possible from fuel tanks and engines.

(*b*) Live wires must be suitably encased when running in the vicinity of fuel tanks or pipes.

(*c*) Fuses must be installed in all ignition circuits other than those of magneto ignition.

2. Ground Engineers should therefore satisfy themselves that all aircraft for the inspection of which they are responsible comply in every respect with the foregoing requirements, and if they find that any alterations or additions are necessary to this end, should warn the owners of the aircraft that such work should be done before the aircraft is submitted for re-inspection for renewal of its Certificate of Airworthiness. Any alterations so found necessary should be treated as major modifications, and particulars must therefore be sent to the Airworthiness Department, Royal Aircraft Establishment, Farnborough, for design approval.

(No. 6 of 1927 and No. 85 of 1927, Notice to Airmen.)

## IMPORTS AND EXPORTS, 1926-1927

**AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910).**

**For 1910 and 1911 figures see FLIGHT for January 25, 1912.**
**For 1912 and 1913, see FLIGHT for January 17, 1914.**
**For 1914, see FLIGHT for January 15, 1915, and so on yearly, the figures for 1926 being given in FLIGHT, January 20, 1927.**

| | Imports. | | Exports. | | Re-Exports. | |
|---|---|---|---|---|---|---|
| | 1926. | 1927. | 1926. | 1927. | 1926. | 1927. |
| | £ | £ | £ | £ | £ | £ |
| Jan. .. | 494 | 1,850 | 130,049 | 49,021 | — | — |
| Feb. .. | 2,089 | 679 | 40,416 | 63,080 | 6,341 | — |
| Mar. .. | 1,001 | 7,087 | 92,840 | 106,478 | 9,758 | 2,270 |
| Apr. .. | 536 | 822 | 160,832 | 71,190 | 5,051 | 785 |
| May .. | 342 | 1,258 | 118,539 | 82,708 | — | 640 |
| June .. | 24,866 | 1,249 | 66,111 | 149,907 | 150 | 162 |
| July .. | 16,033 | 1,798 | 39,047 | 104,167 | — | 750 |
| Aug. .. | 21,401 | 2,453 | 146,129 | 78,742 | 1.035 | — |
| Sept... | 3,172 | 2,045 | 55,674, | 61,946 | — | 59 |
| Oct. .. | 528 | 1,013 | 41,968 | 93,004 | 30 | 45 |
| | 70,462 | 20,254 | 891,605 | 860,243 | 22,365 | 4,711 |

* * * *

## PUBLICATIONS RECEIVED

*U.S. National Advisory Committee for Aeronautics Reports: No.* 262.—Friction of Aviation Engines. By S. W. Sparrow and M. A. Thorne. *No.* 263.—Preliminary Flight Tests of the N.A.C.A Roots Type Aircraft Engine Supercharger. By A. W. Gardiner and E. G. Reid. *No.* 264.—Differential Pressures on a Pitot-Venturi and a Pitot-Static Nozzle over 360 deg. Pitch and Yaw. By R. M. Bear. *No.* 266.—Air Force and Moment for N-20 Wing with certain Cut-Outs. By R. H. Smith. *No.* 267.—Drag of Wings with End Plates. By Paul E. Hemke. *No.* 269.—Factors in the Design of Centrifugal Type Injection Valves for Oil Engines. By W. F. Joachim and E. G. Beardsley. National Advisory Committee for Aeronautics, Navy Building, Washington, D.C., U.S.A.

**Catalogue**

*The V.C.C. Welding Electrode.* Verdun Cutts and Co., Ltd., 87, Fargate, Sheffield.

* * * *

## AERONAUTICAL PATENT SPECIFICATIONS

(*Abbreviations*: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.)

**APPLIED FOR IN 1926**

*Published November* 17, 1927

18,492. H. R. RICARDO. Fluid-pressure engines of sleeve-valve type. (279,176.)
21,135. AKTIEBOLAGET AERIA. Propeller arrangement for flying machines, airships, etc. (257,921.)
21,136. AKTIEBOLAGET AERIA. Flying machines. (257,922.)
21,184. RUY MACHADO DA CRUZ & CIA. Control columns for aircraft. (279,206.)

**APPLIED FOR IN 1927**

*Published November* 17, 1927

1,624. ROHRBACH METALL-FLUGZEUGBAU GES. Aircraft with pusher propellers. (264,844.)
2,173. DR. F. B. DEHN (HEALEY-AEROMARINE BUS CO., INC.). Connecting-rods. (279,289.)
4,900. M. A. KENNEY. Airplane-landing apparatus. (279,307.)
9,895. L. RENAULT. Means for regulating i.c. engines for aircraft. (272,863.)
10,046. DR. A. ROHRBACH. Aeroplane wings. (269,548.)
10,182. DR. A. ROHRBACH. Floating bodies for seaplanes. (269,566.)
10,269. H. HEINRICH. Rotary engine. (270,672.)
25,742. H. JUNKERS. Methods of and apparatus for determining the angle of drift from an aircraft in flight. (278,371.)


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